Chapter III
Affected Environment and Impacts of the Proposed Action

In this section, the Proposed Action refers to Build Alternative C, the recommended Preferred Alternative. The study corridor and environmental considerations are shown on Exhibit II-1, and a summary of impacts is presented in Table II-5.

A. Social Impacts

1. NEIGHBORHOOD AND COMMUNITY COHESION

Residential neighborhoods exist adjacent to the study corridor on the west side of I-35 (Oak Crest subdivision), on the east side of I-35 (Westwood Manor Senior Living mobile home court and Walnut Lane mobile home court), and on the east side of Liberty Drive (Bent Oaks subdivision and Red Oaks subdivision). The alignment of the Proposed Action would travel through mostly undeveloped land and would not bisect or disrupt existing residential and commercial areas. No residences or businesses would be totally acquired by the Proposed Action, and therefore there would be no impacts to the existing cohesion of the neighborhoods and the community. In addition, the Proposed Action would provide a multi-use trail, connecting the Shoal Creek Communities in northern Kansas City to the Liberty and Pleasant Valley communities, and the South Valley Middle School and Junior High School east of I-35.

2. CHANGES IN TRAFFIC PATTERNS

The Proposed Action would provide a new crossing over I-35, thus providing a new route for east/west and north/south travel that does not currently exist. The Flintlock Overpass is expected to be an important east/west link between Liberty and Kansas City as well as an important north/south link. The Flintlock Bridge is anticipated to attract approximately 36,000 vehicles a day in 2030 (refer to Chapter II, Section D. for further discussion on traffic circulation and analysis).

Since the Flintlock Overpass would provide a new route for motorists to travel, reductions in traffic demand can be expected in other corridors. Table III-1, below, shows the change in traffic demand at the two interchanges along I-35 as a result of the Flintlock Overpass improvement.

Table III-1: Change In 2030 PM Peak Hour Traffic at Adjacent Interchanges with Flintlock Overpass

Roadway	M-152 Interchange (at I-35)	Pleasant Valley Rd. / South Liberty Pkwy. (at I-35)
4-Lane Flintlock	- 650	- 1,500

Source: Liberty Travel Model.

In addition, NE 76th Street would cease to travel straight through from Church Road to existing Flintlock Road. Instead, the portion of NE 76th east of Flintlock Road will be re-routed to tie into Flintlock Road south of the existing intersection. A small portion of Liberty Drive would also be re-routed to intersect with the proposed extension of Flintlock Road just south of Little Shoal Creek.

3. SAFETY ISSUES

In this section, traffic safety issues are discussed in relation to crash rates, and public safety is discussed in relation to potential disruptions and improvements to police, fire and emergency service delivery.

a. Highway and Traffic Safety

Improved traffic safety was identified as part of the purpose and need for the Proposed Action and was discussed in Chapter I. The M-152 corridor has a high number of accidents and is significantly above the statewide average for a similar facility. The Proposed Action would reduce traffic and congestion at the M-152 and Pleasant Valley interchanges, thereby decreasing the number of accidents within the two interchanges. They would also improve safety for school buses and motorists wanting to cross I-35 and avoid the two interchanges.

In addition, the existing interchanges at M-152 and at Pleasant Valley Road/W Liberty Drive/I-35 currently provide the only route for pedestrians and bicyclists to cross I-35. The proposed Flintlock Overpass of I-35 will provide a more direct route with less traffic and fewer turning vehicles than the existing interchanges. In addition, the Proposed Action would provide a multi-use trail for pedestrians and bicyclists, which would be separated from the vehicular traffic.

b. Overall Public Safety

All of the police, fire and ambulance facilities that serve the immediate area are located outside of the study corridor and are not directly affected by any of the alternatives.

In the long term, the Proposed Action can be expected to improve local and regional area circulation. The roadway improvements would enhance the overall public safety by addressing congestion and improving response times for emergency vehicles and police personnel as a result of providing smoother flowing transportation facilities in the vicinity of the study corridor.

Construction related activities on NE 76th Street and Liberty Drive may temporarily disrupt routes and travel patterns in the short term for police, fire and ambulance services responding to calls near these locations. Communication with the cities and their emergency services during construction would be imperative in order to facilitate the planning of temporary alternate routes for emergency vehicles.

4. PUBLIC & SEMI-PUBLIC FACILITIES, PARKS AND RECREATION AREAS

The Public and Semi-Public Facilities (civic/institutional) category includes public facilities such as municipal, county, state, or Federal properties or facilities.

Publicly-owned parks, recreation facilities/areas (including some public school play areas), and wildlife and waterfowl refuges have special status under the provisions of Section 4(f) of the U.S. Department of Transportation (USDOT) Act of 1966. Before a transportation project is allowed to proceed with any encroachment on a Section 4(f) property, a specific evaluation must be conducted that tests all proposed alternatives. Before a Section 4(f) property can be used, an evaluation must lead to a finding that there is no feasible and prudent alternative to the taking of that park, recreation area or refuge, and that all possible planning to minimize harm to the resource has been undertaken. FHWA determines the applicability of Section 4(f) to the project under consideration.

A land use survey for the project area indicated that there are no public parks, recreation areas or wildlife refuges located within or near the study corridor. In addition, the State Emergency Management Agency (SEMA) was contacted and it was determined that there are no flood

buyout properties (which are considered publicly owned lands, and which cannot be developed due to open space deed restrictions) located within the study corridor. However, there are two other public properties located within the study corridor as discussed below (see Exhibits II-1 and II-8).

The first property, located east and west of Little Shoal Creek between I-35 and Liberty Drive, is owned by the Liberty Public School District #53. The portion of that land on the east side of the creek contains the South Valley Middle School and the South Valley Junior High School. Other facilities on the property include two soccer fields, a baseball field, and a stadium with a running track and football field. None of the buildings or athletic facilities would be directly impacted by the Proposed Action, however, some of the undeveloped portion of the property west of the school grounds and west of Liberty Drive would be partially impacted. This undeveloped, wooded riparian area of Little Shoal Creek is zoned as "Standard Single-family Residential", and is called "Conservation Land" on the future land use map in the City's 1998-99 comprehensive plan called the "Blueprint for Liberty." However, this land is not a public park or recreation area, nor a wildlife refuge, nor a flood buyout property.

According to the "Blueprint for Liberty," the City's land use designation for "Conservation Lands" is described as follows:

> …"*all of the environmentally sensitive lands in Liberty, including steep slopes, wetlands, woodlands, certain grass lands, wildlife habitats, creeks, and bluffs. These are areas where development would create costly impacts to natural systems, drainage patterns, or the geographic identity of Liberty. Land shown with this designation may be publicly or privately held. Conservation Lands should be factored into the overall design of developing areas as they provide natural landscaping, establish buffers, and contribute to the City's overall storm water management system*".

The school district is in favor of the Proposed Action and has stated that there are currently no plans for using the area as a public park or recreation area. In addition, the city of Liberty's Parks and Recreation Department does not have any future plans to use the area as park land or for public recreation. Based on the previous information, FHWA has determined that the school district property is not Section 4(f) applicable (see letter dated April 19, 2006 in Appendix B.

The second property, located on the west side of Liberty Drive (second lot north of West Liberty Drive), contains a building that houses the Clay County Department of Social Services, Division of Health. Although no direct impact would occur to the building, there would be a partial impact to the property in which seven parking spaces would be removed by the Proposed Action. This property is not managed or used for public recreation or as a wildlife refuge, therefore the FHWA has determined that it is not Section 4(f) applicable (see letter dated April 19, 2006 in Appendix B.

5. PEDESTRIAN AND BICYCLIST CONSIDERATIONS

A major consideration in highway planning and design is the interaction among motorists, pedestrians and bicyclists. There are no existing sidewalks or bicycle facilities adjacent to the travel lanes of the I-35 facility, NE 76th Street, or Liberty Drive. However, there are currently sidewalks along existing Flintlock Road north of NE 76th Street. In addition, the Mid America Regional Council's (MARC) regional bike plan indicates that on-street bike routes (see Exhibit II-1) are proposed for Liberty Drive, Pleasant Valley Road/W Liberty Drive, NE 76th Street (west of Flintlock Rd.), and Flintlock Road (north of NE 76th Street).

The proposed overpass would include a ten foot wide combined pedestrian and bicycle trail on the east side of the overpass, thereby providing a connection with the proposed bike routes (shown on MARC's regional bike plan) that will be located along the streets mentioned above.

6. DEMOGRAPHICS AND SOCIAL CHARACTERISTICS

Demographic and social characteristics were developed for this study based on the 2000 Census. The census data is presented in tables for the Flintlock Road potential impact area, the Flintlock Road Study Corridor, the city of Liberty, the city of Kansas City, the city of Pleasant Valley, the Kansas City Metropolitan Area, Clay County and the state of Missouri. The potential impact area includes the census blocks that are adjacent to Flintlock Road. The Study Corridor, which is broader than the potential impact area, includes census tracts that are adjacent to Flintlock Road. The potential impact area is a worst case scenario composite of all of the concept alternatives. The Study Corridor is contained within census tract numbers 020801, 020802 and 021304 in Clay County.

a. Population

Between 1990 and 2000 the Study Corridor experienced the highest growth with an increase in its population of about 42 percent (see Table III-2). In contrast Kansas City and the State of Missouri experienced patterns of growth with almost two percent and about nine percent increases respectively. The Kansas City MO-KS Metropolitan Area increased between 1990 and 2000 by about 13.4 percent. Clay County and Pleasant Valley experienced the growth at nearly 20 percent and 22 percent respectively. Liberty experienced a slightly higher rate of growth at about 28.2 percent.

The rate of individuals under the age of 20 does not vary greatly among the city, county and state figures. There are a lower percentage of elderly individuals in the Study Corridor as compared with the other areas. The highest percentage of females can be found in the Potential Impact Area at nearly 56 percent, where each of the others range from 51 to 52 percent.

Table III-2: Population, Gender, Age

		Potential Impact Area (block)	Study Corridor	Liberty	Kansas City	Pleasant Valley	Kansas City MO-KS Metro Area	Clay County	Missouri
Total Population		795	18,504	26,232	441,545	3,321	1,776,062	184,006	5,595,211
% Change - 1990 to 2000		--	42.2	28.2	1.5	21.6	13.4	19.9	9.3
% Male		44.5	48.0	47.9	48.2	48.5	48.8	48.5	48.6
% Female		55.5	52.0	52.1	51.8	51.5	51.2	51.5	51.4
Age	Under 20	231	5,715	8,214	122,961	863	517,236	51,948	1,578,834
	% Under 20	29.0	30.9	31.3	27.9	26.0	29.1	28.2	28.3
	20-64	452	11,145	15,302	266,662	2,078	1,056,371	112,172	3,251,339
	% 20-64	59.9	60.2	58.3	60.4	62.6	59.5	61.0	58.2
	Over 64	112	1,644	2,716	51,646	380	202,455	19,886	756,038
	% Over 64	14.1	8.9	10.4	11.7	11.4	11.4	10.8	13.5

Note: Potential Impact Area is calculated at the block level and the Study Corridor is calculated at the tract level.
Source: U.S. Census Bureau and Missouri Census Data Center, Census 2000

b. Minority Populations

The percentage of non-whites is similar within the potential impact area, the Study Corridor and the cities of Liberty and Pleasant Valley, ranging from about six percent to seven percent (see Table III-3). Clay County, the Kansas City Metropolitan Area and the state of Missouri have higher non-white populations, ranging from 9.5 percent to 19.2 percent. The city of Kansas City has the highest non-white population at about 42.1 percent.

Table III-3: Racial Characteristics (2000)

	Potential Impact Area (block)	Study Corridor	Liberty	Kansas City	Pleasant Valley	Kansas City MO-KS Metro Area	Clay County	Missouri
Total Population	795	18,504	26,232	441,545	3,321	1,776,062	184,006	5,595,211
White	739	17,283	24,592	268,449	3,124	1,435,388	170,092	4,746,952
Black	25	321	680	135,671	73	226,503	4,524	622,087
American Indian & Alaskan Native	5	80	104	2,308	25	8,429	979	26,200
Asian	1	252	160	8,372	20	28,654	2,165	60,429
Native Hawaiian or Other Pacific Islander	0	79	17	431	0	1,829	172	3,071
Other Race	13	173	261	14,168	25	40,431	1,906	45,524
Two or More Races	12	316	418	11,870	54	34,828	4,168	90,948
Hispanic or Latino (of any race)	23	595	703	30,374	98	93,450	6,364	116,373
% Minority (non-white)	7.0	6.6	6.3	42.1	5.9	19.2	9.5	16.2

Note: Potential Impact Area is calculated at the block level and the Study Corridor is calculated at the tract level.
Source: U.S. Census Bureau and Missouri Census Data Center, Census 2000

c. Housing Characteristics

The housing characteristics of the potential impact area and the Study Corridor are compared with city, county, regional and state characteristics in Table III-4. Clay County, the cities of Liberty and Pleasant Valley, the Study Corridor and the potential impact area have similar percentages of occupied housing units; the percent of occupied housing units was around 95 or 96 percent. The potential impact area and the city of Kansas City have lower percentages of owner occupied housing, at 50.6 percent and 57.7 percent respectively. In contrast the Study Corridor and the city of Liberty have much higher percentages of owner occupied housing at about 73 percent and 77 percent respectively.

The highest median home value appears at the high end of the range for the Study Corridor. The Study Corridor shows the range of median home values within the census tracts, which runs from $100,300 to $148,300. There is a wide range of median rents with the Study Corridor as well. The highest median rent, which is $827, is located in Tract 021304.

d. Income and Poverty

Table III-5 identifies income and poverty characteristics. As shown, Kansas City and Missouri have the lowest median household incomes at $37,298 and $37,934 respectively. The median household income in the Study Corridor ranks the highest, ranging from $46,097 to $64,518. Liberty also has a high median household income at $52,745. Clay County, the Study Corridor, Liberty and Pleasant Valley had a similar percentage of persons below the poverty level ranging from about 4.5 to 5.5 percent. The highest percentage of persons below the poverty level is in Kansas City at about 14.3 percent. The lowest per capita income is for the state of Missouri at $19,936.

Table III-4: Housing Characteristics (2000)

	Potential Impact Area (block)	Study Corridor	Liberty	Kansas City	Pleasant Valley	Kansas City MO-KS Metro Area	Clay County	Missouri
Total Housing Units	322	7,207	9,973	202,273	1,385	740,884	76,230	2,442,017
Total Vacant Housing Units	10	333	462	18,315	57	46,416	3,672	247,423
Total Occupied Housing Units	312	6,873	9,511	183,958	1,328	694,468	72,558	2,194,594
Percent Occupied	96.9	95.4	95.4	90.9	95.9	93.7	95.2	90.0
Owner Occupied Units	158	5,322	6,987	106,078	919	471,843	51,282	1,542,310
Renter Occupied Units	154	1,552	2,524	77,880	409	222,625	21,276	652,284
Percent Owner Occupied	50.6	77.4	73.5	57.7	69.2	67.9	70.7	70.3
Average Household Size	--	2.65	2.62	2.35	2.42	2.52	2.50	2.48
Average Family Size	--	2.90 – 3.28*	3.08	3.06	2.92	3.08	3.00	3.02
Median Home Value	--	$100,300 – 148,300**	$121,600	$84,000	$102,800	$92,400 – 129,900**	$104,900	$89,900
Median Gross Rent	--	$526 – 827***	$551	$548	$613	$546 – 631***	$576	$484

Note: Potential Impact Area is calculated at the block level and the Study Area is calculated at the tract level.
Block level data was not available for all categories.
* Range of Average Family Size
** Range of median home values.
***Range of median rent.
Source: U.S. Census Bureau and Missouri Census Data Center, 2000 Census

Table III-5: Income and Poverty (2000)

	Study Corridor	Liberty	Kansas City	Pleasant Valley	Kansas City MO-KS Metro Area	Clay County	Missouri
Total Population	18,504	26,232	441,545	3,321	1,776,062	184,006	5,595,211
Median Household Income	$46,097–64,518*	$52,745	$37,198	$48,684	$42,405 – 52,297*	$48,347	$37,934
Per Capita Income	$23,914–24,733	$23,415	$20,753	$26,084	$21,452 – 26,168**	$23,144	$19,936
Number of Persons below Poverty Level	985	1,237	61,958	149	147,703	9,898	637,891
% of Persons below Poverty Level	5.3	4.7	14.3	4.5	8.3	5.5	11.7

Note: Potential Impact Area is calculated at the block level and the Study Area is calculated at the tract level.
* A range is shown to accurately reflect the Median Household Income by census tract within the Study Corridor and both the Missouri and Kansas portions of the Metro Area.
** A range is shown to accurately reflect the Per Capita Income by census tract within the Study Corridor and both the Missouri and Kansas portions of the Metro Area.
Source: Missouri Census Data Center, 2000 Census

7. ENVIRONMENTAL JUSTICE AND TITLE VI CONSIDERATIONS

On February 11, 1994 President Clinton issued Executive Order on Environmental Justice 12898. The Executive Order requires all federal agencies to address the impact of their programs with respect to environmental justice. The Executive Order states that, to the extent practical and permitted by law, neither minority nor low-income populations may receive disproportionately high or adverse impacts as a result of a proposed project. It also requires that those representatives of any low-income or minority population that could be affected by the project be given the opportunity to be included in the impact assessment and public involvement process.

The provisions of the Americans with Disabilities Act of 1990 (ADA) and the provisions of Title VI of the Civil Rights Act of 1964 will be followed. This is to ensure that no person shall, on the grounds of race, color, national origin, age, sex or disability be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance.

The study corridor is not considered to have a low-income population or minority population that would require special considerations under the guidance of Environmental Justice procedures. The Proposed Action would not require the acquisition of any residences or businesses, and would therefore not result in adverse or disproportionate impacts to any minority or low income population. In addition, a pre-location public meeting was held in order to actively involve the residents in the planning process.

B. Economic Impacts

Traffic User Costs

The Flintlock Overpass Build condition will provide improved travel for motorists by reducing travel time and travel distance. Travel time will be improved for motorists because motorists will be able to avoid the heavily congested interchanges of M-152 (at I-35) as well as Pleasant Valley (I-35/US 69/Pleasant Valley Road/W. Liberty Drive). Consequently improved travel times would occur for motorists who shift to the new, less congested, Flintlock Overpass and for motorists that continue to use the M-152 interchange as well as the Pleasant Valley interchange. Motorists will also benefit from reduced travel distance with the Flintlock Overpass Build condition. An alternative option for drivers to cross the interstate to access land uses on both sides of I-35 means that travel distances and travel times are reduced for all motorists. Therefore, improvements to travel for motorists who use the Flintlock Overpass as well as motorists who remain at the existing interchanges means cost-savings to all drivers with the reduction in both travel times and travel distance. Table III-6 shows the reduction in PM peak hour vehicle miles traveled and vehicle hours traveled in the study area.

Table III-6: Change in 2030 PM Peak Hour Traffic User Benefits

Roadway	No-Build	Build	Change
PM Peak Hour Vehicle Hours of Travel (VHT)	1,211	1,122	-89
PM Peak Hour Vehicle Miles of Travel (VMT)	43,421	41,731	-1,690

Source: Liberty Travel Model.

C. Land Use Impacts

1. LAND USE PLANNING

The study corridor is comprised of a small portion of the City of Kansas City, Missouri (on the west side of I-35), a portion of the City of Liberty, Missouri (on the east side of I-35), and the far

eastern edge of the City of Pleasant Valley (on the west side of Liberty Drive), all of which are in Clay County.

Kansas City, Missouri has a set of zoning ordinances and zoning maps, and the City and its citizens prepared a city-wide master plan called FOCUS (Forging Our Comprehensive Urban Strategy) to guide the future of the City for the next 25 years. The FOCUS Plan contains components that provide land use planning guidelines and strategies for addressing the future character of growth. The study corridor in Kansas City includes a small portion of District 1 (north of the Missouri River), based on the boundaries of the City Council Districts.

Liberty, Missouri also has zoning and subdivision regulations (called the Unified Development Ordinance) and a zoning map. In 1998-99 the city of Liberty developed a comprehensive plan called the "Blueprint for Liberty." The plan was a community effort which gained citizen input in charting Liberty's course for the future through updating its 1987 Comprehensive Plan (called "Liberty Outlook - the Quality Continues"). Then in May of 2005, the City amended the comprehensive land use plan in the southern part of Liberty around the South Liberty Parkway which is currently under construction.

The City of Pleasant Valley does not have an adopted comprehensive plan. Planning and zoning issues are dealt with on a case-by-case basis by a committee.

Existing land use categories located within the study corridor (see Exhibit III-1) are mostly undeveloped, which includes the wooded riparian corridor of Little Shoal Creek and the agricultural (pasture) area on the south side of NE 76th Street. Existing land uses at the south end of the study corridor along Liberty Drive include residential on the east side of Liberty Drive, and office, light industrial, and public/semi-public (Department of Social Services) on the west side of Liberty Drive. In addition, the existing land use at the northeast corner of the study corridor (along NE 76th Street) is light industrial and office. On the east edge of the study corridor, the existing land use is public/semi-public, with only the west edge of the South Valley Middle School and Junior High School athletic fields being in the study corridor.

Based on the available future land use plans, the future land uses within the study corridor (see Exhibit III-2) on the west side of I-35 are shown as low density residential and office, and include the extension of Flintlock Road south of NE 76th Street (existing land use is undeveloped and agricultural). On the east side of I-35 the 1998-99 future land use map shows the wooded riparian area of Little Shoal Creek as an undeveloped area and is called "Conservation Land." It is currently owned by the Liberty Public School District #53, however, it is not public park land, wildlife refuge or flood buyout property. According to the "Blueprint for Liberty," the City's land use designation for "Conservation Lands" is described as "*all of the environmentally sensitive lands in Liberty… where development would create costly impacts to natural systems, drainage patterns, or the geographic identity of Liberty… Conservation Lands should be factored into the overall design of developing areas as they provide natural landscaping, establish buffers, and contribute to the City's overall storm water management system*". The 2005 future land use plan for the south Liberty area indicates that most of those lands previously shown as "Conservation Lands" in that area (on the 1998-99 plan) are now designated as "Floodplain."

For the most part, future land uses adjacent to the study corridor would change from the existing land use in some of the areas that are currently undeveloped. West of I-35, low density residential development is planned for the undeveloped area north of NE 76th Street, office development is planned for the area south of NE 76th. East of I-35, future commercial/business development could occur on undeveloped land west of Liberty Drive (in Pleasant Valley city limits). The area immediately south of W Liberty Drive (the new South Liberty Parkway corridor)

is planned to change from agricultural to neighborhood commercial and mixed use. The new South Liberty Parkway is being constructed in the area south of W Liberty Drive. Other areas immediately adjacent to the study corridor are shown on future land use maps as remaining the same as existing.

2. LAND USE PLANNING IMPACTS

Based on the available future land use plans, the only change that would occur to the designated future land uses within the study corridor would be at the Little Shoal Creek riparian area on the east side of I-35, where the proposed roadway would travel on the edge of some of the land shown as conservation land. Regarding the remaining areas within the study corridor and the areas adjacent to the study corridor, there would be no anticipated major land use changes from those identified on the future land use plans as a result of implementing the proposed roadway. As a result, the roadway is consistent with the cities' future land use plans. The study corridor is located in a rapidly developing urban area and development will occur in the currently undeveloped areas according to each city's plans.

D. Farmland Impacts

Within the study corridor there are no agricultural areas with cultivated crops or livestock, and all of the land within the study corridor is within the city limits of Kansas City, Liberty and Pleasant Valley. As such, the area meets the definition of land that is "already in or committed to urban development or water storage," as contained in the Farmland Protection Policy Act (7 CFR, Part 658). None of the area within the study corridor on the cities' future land use plans is shown as agricultural. Therefore, the area is not covered by the Act and the land is not considered prime farmland or farmland of statewide importance, and a Farmland Conversion Impact Rating is not applicable or necessary.

Through coordination with the Clay County NRCS, it was also determined that there are no lands involved in the Conservation Reserve Program (CRP) or the Wetlands Reserve Program (WRP) within the study corridor (see Record of Telephone Call, dated May 11, 2005, in Appendix B).

E. Right-of-Way Impacts

Among the various impacts of the construction of a highway or other major transportation improvement project, the acquisition of real property, including residences and businesses, is the action which engenders the most discussion among those directly affected. In an effort to make the property acquisition process as equitable as possible, regulations of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (42 U.S.C. 4601) and the requirements of Title VI of the Civil Rights Act of 1964, will be followed to ensure adequate consideration and compensation for the persons whose property is required for the project.

The Uniform Act, as well as Missouri state laws, require that just compensation be paid to the owner of private property taken for public use. The appraisal of fair market value is the basis of determining just compensation to be offered the owner for the property to be acquired. An appraisal is defined in the Uniform Act as a written statement independently and impartially prepared by a qualified appraiser setting forth an opinion of defined value of an adequately described property as of a specific date, supported by the presentation and analysis of relevant market information.

The right-of-way acquisition impacts include land that is acquired for highway construction and operation purposes. Right-of-way impacts can include total acquisition (i.e. the entire tract, parcel or lot is acquired for right-of-way) and partial acquisition (i.e. only a portion of the tract, parcel or lot is acquired for right-of-way). With a partial acquisition, a habitable residence or viable commercial business would remain and the primary structure would not be acquired. The right-of-way impacts can be seen on Exhibit II-8.

1. PROPERTY IMPACTS

a. No-Build Alternative

The No-Build Alternative would not require additional right-of-way and therefore would have no property impacts.

b. Proposed Action (Build Alternative)

Total property acquisition is not required, however, the Proposed Action would require the partial acquisition of the following 15 properties, containing a total of approximately 17.7 acres (Partial acquisition impacts and estimated right-of-way costs are summarized in Table III-7):

- ***Residential*** – 7 parcels totaling approximately 0.7 acre (minimal acquisition of land only – at rear lot lines)
- ***Business*** – 2 parcels containing approximately 0.6 acre (one parcel with impacts to the edge of a gravel storage area for semi-trailers; and one parcel at Havens Construction – land only)
- ***Public/Semi-public*** – 2 parcels containing approximately 11.0 acres (one parcel of open land owned by Liberty Public School District #53; and a one parcel at the Department of Social Services – 7 parking spaces impacted)
- ***Undeveloped Land*** – 4 parcels containing approximately 5.4 acres (two parcels north of NE 76th Street; one parcel of open pasture area south of NE 76th St.; and one parcel of wooded area west of Liberty Drive)

In addition to partial land acquisition, the project may require temporary or permanent easements for construction or utility location/re-location. A temporary construction easement is the right to use land for purposes of constructing the roadway. After construction is complete, the temporary easement expires, the area is restored to pre-construction or otherwise acceptable conditions, and the ownership remains with the existing property owner. Permanent construction easements; such as those for retaining wall construction, highway signage, and drainage easements at the end of culverts; have many of the same characteristics as a temporary construction easement except that the entity responsible for facility maintenance would have the right of access to maintain or repair its facilities within the easement, but it would not own the property. Ownership remains with the existing property owner.

Table III-7: Property Acquisition and Estimated Right-of-Way Costs
(2008 Dollars – in $million)

Number of Partial Acquisitions	Estimated Acreage of Impacted Parcels	Right-of-Way Acquisition Cost	Construction Easement Cost	Total Right-of-Way Cost
15	17.7	$2.32	$0.52	$2.84

Note: Estimated right-of-way costs include project overhead costs.

There would be no total acquisition of residential or commercial property by the Proposed Action, therefore there is no need for ascertaining available residential or commercial replacement property in the surrounding area.

Mitigation – Property owners will be compensated at fair market value for any property acquired. Parking losses will be discussed with the property owner or business owner to determine options for replacing the amount of lost parking spaces or providing fair compensation for the loss of parking.

F. Geology

1. GENERAL

The proposed project is located within the Dissected Tills Plains of the Central Lowland physiographic province. The topography is characterized by glaciated, open low rolling hills with steep valley slopes. Local relief in the area varies in Elevation from 830 to 770. The land has a mixed use of agricultural to rural and urban type development. Surface drainage of the Little Shoal Creek drainage area has been altered by area development. General subsurface conditions consist of varying thicknesses of glacial soils, alluvial soils and fill materials underlain by Pennsylvanian age sedimentary bedrock.

Bedrock geology is characterized by essentially flat-lying Pennsylvanian Age sediments consisting of alternating layers of limestone and shale from the Lansing Group and Zarah Subgroup of the Kansas City Group.

2. MINING

Glacial soil and limestone mining operations for construction have been noted in and around Clay County. Currently, there are no active mining operations visible within the project area. Review of the Inventory of Mines, Occurrences and Prospects by the Missouri Department of Natural Resources as noted in a correspondence dated August 2, 2005 (see Appendix B) indicates the existence of a possible Works Progress Administration (WPA) vintage quarry located in the area now occupied by the South Valley Middle School and Junior High School.

Subsurface investigations will be performed in the design phase to identify subsurface conditions that could influence design and construction activities.

G. Water Resources Impacts

In the preliminary inventory of existing water resources within the study corridor, data was gathered from USGS quadrangle maps, the U.S. Fish and Wildlife Service's (USFWS) National Wetlands Inventory (NWI) maps, the Natural Resources Conservation Service's (NRCS) Food Security Act (FSA) wetland mapping, aerial photography, and field investigations. The existing water resources include streams and potential wetlands (no ponds are present), and are presented on Exhibits III-3 through III-7. The results of the field investigations, including photographs and data forms, are included in the Waters of the U.S. and Preliminary Jurisdictional Wetland Determinations Summary Report, which is available upon request.

The NWI maps are based on a classification system known as the Cowardin System (named after its principal author, Cowardin et. al. 1979). This system classifies the types of ecosystems related to water resources which, in this region, include streams, lakes, ponds, and vegetated wetlands. After a review of the water resource data and aerial photography, it was determined that the only Cowardin system represented in the study corridor is the Palustrine Forested (PFO) wetland system.

Section 404 of the Clean Water Act regulates discharges of dredged or fill materials into "waters of the U.S." (streams, lakes, wetlands, and ponds that are connected to streams). The U.S. Army Corps of Engineers (USACE) is the regulatory agency responsible for administering the Section 404 permit program. At the beginning of the EA process the USACE was contacted and a response letter was received from the Corps (see letter in Appendix B, dated June 2, 2005). The Corps had no specific concerns other than stating that a Section 404 permit would be necessary if dredged or fill material is discharged into any waters of the U.S.

1. STREAMS

The streams within the study corridor include Little Shoal Creek and three unnamed tributaries of Little Shoal Creek. According to the USGS map, Little Shoal Creek and the northern most unnamed tributary are perennial streams. The southern most tributary is an intermittent stream, and there is a small ephemeral tributary located west of the school athletic facilities. These four streams have discernible ordinary high water marks and are therefore under USACE jurisdiction as "waters of the U.S." Little Shoal Creek is not on the list of designated Wild and Scenic Rivers.

Stream Impacts

The No-Build Alternative would have no impacts to streams. The stream impacts for the Proposed Action would be in the form of fill material from culverts or embankment placed within the Ordinary High Water Mark of the stream. Where streams are bridged, these types of impacts would be avoided or minimized. A USGS location map and enlarged plan views of stream crossing areas are presented on Exhibits III-3 through III-7. In addition, potential impacts at each stream crossing are presented in Table III-8.

The Proposed Action would involve eight stream crossings. Five of those crossings would be bridged, which includes four at Little Shoal Creek and one at the unnamed tributary southeast of the NE 76th Street/Flintlock Road intersection. The bridged stream crossings of Little Shoal Creek (1, 3a, 3b and 5) would not result in linear impacts from fill material. However, the unnamed tributary that would be bridged (stream crossing 2, south of NE 76th Street) would require some relocation, and the existing bridge on NE 76th Street (east of Flintlock Road) would be removed. Although this would result in 310 linear feet of stream being filled (except for the bend of the stream at this location), equating to 0.11 surface acres of impacts, a new relocated channel, totaling 420 linear feet would be constructed to the east of the existing one.

One stream crossing that would require a culvert would occur at the ephemeral stream west of the school (stream crossing 4), which would result in 175 linear feet of channel being filled, equating to 0.01 surface acres of impacts. In addition, the existing culvert that conveys Little Shoal Creek under Liberty Drive (stream crossing 7) would be extended on the southeast side resulting in 8 linear feet of channel being filled, equating to 0.01 surface acres of impacts.

The south unnamed tributary of Little Shoal Creek west of Liberty Drive (stream crossing 6) would be crossed and would be filled and relocated. This would result in 570 linear feet of stream being filled, equating to 0.10 surface acres of impacts. However, a new meandering channel, totaling 440 linear feet would be constructed (on the west side of the proposed roadway) that would tie into the Little Shoal Creek main channel.

As shown in Table III-8, a total of 1063 linear feet of stream channel would be filled, equating to 0.23 surface acres of impacts. The total length of new channel construction (relocation of an existing channel) would be 860 linear feet.

Table III-8: Stream Crossing Impacts

Stream Crossing #	Stream Name	USGS / NWI	Soil Mapping	Water of the U.S.	Impact Type	OHWM Width (ft)	Impact Length (ft)	Impact Area (acres)
1*	Little Shoal Creek	Bln-P	HI	Yes	Bridge	15	0	0.00
2**	Unnamed Tributary of Little Shoal Creek	Bln-P	HI	Yes	Bridge/ Fill/ Relocation	15	310	0.11
3a* 3b*	Little Shoal Creek	Bln-P	HI	Yes	Bridge	25	0	0.00
4	Unnamed Tributary of Little Shoal Creek	None, Ephemeral	HI	Yes	Culvert	3	175	0.01
5*	Little Shoal Creek	Bln-P	HI	Yes	Bridge	22	0	0.00
6	Unnamed Tributary of Little Shoal Creek	Bln-I	HI	Yes	Culvert Fill/ Relocation	8	570	0.10
7	Little Shoal Creek	Bln-P	HI	Yes	Culvert	30	8	0.01
TOTALS							**1063**	**0.23**

* Indicates bridged stream crossing. Length of stream is considered NOT impacted. Surface area impacts are considered to be 0.
**This stream is also bridged, however part of it will be filled and relocated.
Bln-I = Blueline Intermittent; Bln-P = Blueline Perennial; NH = Non-hydric soil; H = Hydric Soil; HI = Hydric Inclusions

2. WETLANDS

Areas mapped as vegetated wetlands on the NWI maps (PEM – palustrine emergent, PSS – palustrine scrub-shrub, PFO – palustrine forested) have the potential of being regulated as special aquatic sites by the USACE. The regulatory definition of wetlands, as adopted by the EPA and USACE to administer the Section 404 permit program is as follows:

> *(Wetlands are) those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, bogs, and similar areas (EPA, 40 CFR 239.2 and CE, 33 CFR 328.3).*

This definition emphasizes the fact that wetlands must possess the following three essential characteristics before a positive determination of a wetland can be made: hydric soils, a prevalence of hydrophytic vegetation, and a persistent wetland hydrology. Jurisdictional wetland determinations performed for regulatory purposes are not dependent on the NWI Cowardin classification system, but on these three mandatory characteristics.

Within the study corridor, there are six areas shown on the NWI maps that are classified as vegetated wetlands (see Exhibits III-3 through III-7). All of these areas are classified as the palustrine forested wetland system (PFO1A – palustrine forested, broad-leaved deciduous, temporarily flooded) located along the riparian corridor of Little Shoal Creek. Field delineations were performed at the three NWI mapped areas that are within the impact zones of the alternatives (NWI wetlands 1, 2 and 3). It was determined that none of those areas meets all three of the wetland criteria parameters to be considered jurisdictional wetlands. The entire alignment of the Proposed Action was checked for other potential wetland areas, however, no other areas exhibiting wetland characteristics were found within the impact zone of the Proposed Action.

In addition to the mapping sources listed above, data was also gathered from NRCS soil survey maps to determine the presence or absence of hydric soils. This data indicated that the area

along the Little Shoal Creek riparian corridor contains soils with hydric inclusions, but the main component is not hydric. Coordination with the NRCS also indicated that there are no lands involved in the Wetlands Reserve Program (WRP) within the study corridor.

Wetland Impacts

Based on the preliminary findings of the field delineations, there are no jurisdictional wetland areas within the impact zone of the Proposed Action, therefore, there are no impacts to vegetated wetland areas.

3. COMPENSATORY MITIGATION

Construction activities requiring discharges into jurisdictional "waters of the U.S.," which include streams, wetlands and other special aquatic sites, will require a Department of the Army Permit under Section 404 of the Clean Water Act (permits are discussed in more detail in Section P. of this chapter). Streams are regulated below the limits of the ordinary high water mark (OHWM). Impacts to Little Shoal Creek and its perennial tributary would be minimized by bridging the creeks.

Where appropriate, possible mitigation strategies for stream impacts could include new channel construction (stream relocation to partially offset filled streams), utilizing grade control structures, stabilizing disturbed banks with a combination of live vegetation and riprap or erosion control mats (bioengineering techniques), incorporating native seeding and plantings along the stream banks and buffer zones, or by providing an in-lieu fee for stream mitigation at other locations through programs such as the Stream Stewardship Trust Fund.

During the project design phase, specific impacts to "waters of the U.S." will be assessed to determine if those impacts can be avoided or minimized. At that time coordination will take place with the USACE and appropriate resource agencies during the project design process to develop appropriate mitigation strategies, which would include consideration of bridge construction techniques and design of any mitigation (whether on-site or off-site) the USACE deems necessary as compensation for project impacts to waters of the U.S.

H. Water Quality Impacts

1. SURFACE WATER QUALITY

The study corridor is located within the Lower Missouri-Crooked watershed (Hydrologic Unit #10300101). The surface water resources in the study corridor were discussed previously in Section G. Water Resources. The quality of these resources varies depending upon such factors as water permanence, type of shoreline/bank and surrounding vegetation, substrate, presence or absence of in-flowing streams, and surrounding land use. In this type of urban environment which is experiencing rapid land development, major concerns include construction site erosion (siltation), channelization or other alteration of natural stream channels, and residential and commercial use of pesticides and fertilizers. All surface runoff in the study corridor eventually flows into Little Shoal Creek.

The federal Water Pollution Control Act, section 303(d), requires that each state identify those waters that are not meeting the state's water quality standards (i.e. for which existing required pollution controls are not stringent enough to implement state water quality standards). For these waters, states are required to establish total maximum daily loads (TMDLs) according to a priority ranking. A TMDL is a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards. The Revised Environmental Protection Agency (EPA) Consolidated 2002 Missouri 303(d) List (made available in January 2004) and the Missouri

Department of Natural Resources' (MDNR) list of 303(d) impaired waters (modified as of May 2004) were reviewed, and it was determined that the Little Shoal Creek was not on either of these lists. In addition, there are no Outstanding National or State Resource Waters within the study corridor.

2. SURFACE WATER QUALITY IMPACTS

The Little Shoal Creek and an unnamed tributary of it are the only water resources within the study corridor, however, neither are on the 303(d) list of impaired waters. In this type of urban environment, which is experiencing rapid land development, major concerns include construction site erosion (siltation), channelization or other alteration of natural stream channels, and residential and commercial use of pesticides and fertilizers. All surface runoff in the study corridor eventually flows into Little Shoal Creek. The Missouri Department of Natural Resources (MDNR) was contacted via a letter requesting information concerning environmental considerations within the study corridor. The MDNR's response is located in Appendix B.

a. No-Build Alternative

The No-Build Alternative would have no additional impacts to water quality, other than the on-going operation and maintenance related pollutants from roadways, and the runoff from adjacent land developments that currently contribute to water quality impacts.

b. Proposed Action (Build Alternative)

Direct water quality impacts include highway or bridge runoff, construction-related impacts, and operation and maintenance related impacts.

Construction related impacts are primarily due to the erosion of cleared areas, operation of heavy earth-moving equipment, and storage of construction materials and supplies, and could include pollutants such as petroleum products, sedimentation, and nutrients leaching from seeded and mulched bare areas. Temporary impacts to water resources in and adjacent to the study corridor can be prevented or minimized by following the management practices outlined by the MDC including the State Channel Modification Guidelines when modifying channels or relocating streams.

In addition, the project will comply with specific conditions of Section 401 Water Quality Certification, which become conditions of the Section 404 permit. This includes, for example, the following methods to minimize impacts: graded areas should be seeded and mulched as soon as possible using native planting and seeding recommendations; disturbance to the stream banks and riparian zones should also be minimized; work should be minimized between March 1 and June 15; and all standard erosion protection devices such as ditch checks and silt fences shall be installed at the outset of construction and maintained throughout the construction period.

The National Pollutant Discharge Elimination System (NPDES) permit, administered by MDNR, requires that slopes and ditches be properly designed to prohibit or reduce erosion. To protect the environment from sedimentation and construction pollutants during the building phase, the control of water pollution is to be accomplished by the use of Best Management Practices (BMPs) as developed by the Kansas City Metro Chapter of the American Public Works Association. The BMPs can include measures such as the use of temporary berms, ditch checks, slope drains, sediment basins, straw bales, silt fences, seeding and mulching. Temporary and permanent runoff drainage (retention or detention) basins, if appropriate, may also be designed and installed to lessen water quality impacts by trapping sediment and other contaminants, while reducing erosive storm surges.

In addition, the Missouri Department of Conservation (MDC) recommends that native vegetation be planted along the portions of the roadway that remain undeveloped to minimize erosion and mitigate for the increased runoff from impermeable road surfaces. The cities of Kansas City and Liberty will consider utilizing native vegetation in disturbed areas where appropriate. The cities will also consider the guidelines of the MDNR Solid Waste Management Program, which suggests that compost or wood chips be used whenever possible during construction.

Potential operation and maintenance related impacts to water quality could include pollutants such as petroleum products, coolants, rubber debris, metals, and de-icing minerals/chemicals. There is also the possibility of collisions on any roadway, regardless of operating characteristics and traffic volumes. Collisions can contribute to pollutants, as chemicals spilled could run off or be flushed into drainage channels.

3. GROUNDWATER QUALITY IMPACTS

Groundwater is moderately transmissible through the fractures, bedding and solution features of the rock. Shale layers are rather impermeable. The soils are relatively pervious and easily eroded without vegetation cover.

There are no public drinking wells, wellhead protection areas, or sole-source aquifers within the study corridor, therefore no effects to those types of groundwater supplies are anticipated. There is the possibility that karst features may exist in the subsurface in some portions of the corridor. This will be determined during the design phase of the project. If it is determined that karst features exist, care will be taken during construction activities to avoid spills or discharges in or near these areas. In addition, vegetated slopes and swales, and detention systems in appropriate locations can provide treatment of potentially polluted runoff from the roadway, thereby avoiding or minimizing impacts to groundwater quality.

I. Floodplain Impacts

1. INTRODUCTION

Floodplains provide natural and beneficial values to nature and society. For example, vegetation in the floodplain provides food, resting and nesting areas for wildlife. Floodplains can also provide water storage during floods, reducing peak discharges and act as filters to purify the flood water that is temporarily stored there. Floodplains can also provide open areas or green spaces that provide aesthetic or recreational value to a community.

Federal Emergency Management Agency (FEMA) regulatory floodways are defined in accordance with 44 CFR 59.1 and are also described by the FHWA guideline 23 CFR 650, which has identified the base (100-year) flood as the flood having a one percent probability of being equaled or exceeded in any given year. The regulatory floodway is defined as the channel of a stream or watercourse, with adjacent areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than the designated height. The impact of projects constructed in and near the defined floodway is prescribed to cause “no rise” in the regulatory base flood elevation, which defines the regulatory floodway. FEMA has mandated that no more than a one-foot cumulative rise for all projects in the base (100-year) floodplain is allowed. According to the regulatory requirements of 44 CFR 60.3, a concern addressed in the encroachment review is the determination of the project impacts on increases in the base flood elevation. The basic design intent for this project is to limit impacts such that there is no rise in the base flood elevation.

At the beginning of the Draft EA process, a letter was sent to the State of Missouri Emergency Management Agency (SEMA) requesting comments concerning the project. In reply to this

correspondence, SEMA stated that any development associated with the project, located within a Special Flood Hazard Area, requires a floodplain development permit from SEMA for the proposed project (see letter dated May 31, 2005 in Appendix B). A Special Flood Hazard Area is defined as a FEMA identified high risk flood area where flood insurance is mandatory for properties. Missouri SEMA requires an encroachment certificate typically referred to as a "No-Rise" Certificate and a statement as to the impacts of the project on the regulatory floodway, before granting a permit. A qualified, registered professional engineer must certify the hydraulic analysis to current FEMA standards.

The study corridor lies within the Little Shoal Creek floodplain. As part of the alternatives analysis, the 100-year floodplain and the FEMA regulatory floodway limits as defined in the Flood Insurance Rate Mapping (FIRM) and Flood Insurance Studies (FIS) for the area were examined. In this reach, Little Shoal Creek is a small, meandering, slightly entrenched stream. There are two unnamed tributaries (UNT) confluencing with the creek in this reach. The larger east branch UNT confluences with Little Shoal Creek in the vicinity of and downstream of present NE 76th Street. The smaller UNT, draining an area in the corporate limits of Pleasant Valley, confluences with Little Shoal Creek near Liberty Drive.

Exhibits II-1 and II-8 show the extent of the base 100-year floodplain and the regulatory floodway boundaries within the study corridor and in relation to the Proposed Action.

2. FLOODPLAIN ENCROACHMENT

The proposed project would require several crossings of Little Shoal Creek proper, as well as both of the unnamed tributaries (UNTs). Construction is anticipated to include: embankment fill for the roadways; fill at bridge abutments; select revetment measures to maintain a stable channel; and select channel modifications to mitigate stream impacts. This construction is anticipated to encroach on specific areas of the floodplain and an estimate of acreage impacts is summarized in Table III-9. There are four (4) proposed bridges within the project. The bridges are proposed to be clear spans of the channel proper. The estimated total width of floodplain that would be crossed is also included in the table and is shown in linear feet.

Table III-9
Estimated 100-Year Floodplain Encroachments

Alignment	100-Year Floodplain Crossing (linear feet)	100-Year Floodplain Encroachment (acres)
Proposed Action (Alternative C)	1895	4.01

3. FLOODING RISKS

As noted, the project is located within the corridor of Little Shoal Creek and two of its tributaries. At the portion of Little Shoal Creek upstream of I-35, it is anticipated that a bridge would be required to span the eastern branch UNT near the confluence with Little Shoal Creek main branch. This is in the vicinity of existing NE 76th Street, immediately downstream of the existing structure spanning the UNT. Under existing conditions, there is some attenuation of flow at this location. The existing span would be demolished and the existing NE 76th Street roadway embankment would be excavated back to restore the stream channel. The stream channel in this area is proposed to be modified to not only improve the hydraulic conveyance through the bridge, but also to restore some of the natural planform morphology. The new structure would span the floodway and it is anticipated that this structure would not further impact the floodplain nor encroach significantly on the existing, defined FEMA regulatory floodway.

The main flyover bridge spanning both Little Shoal Creek and I-35 would be located such that the impacts to the Little Shoal Creek floodway would be largely avoided. The stability of the channel in the area of the abutment of this bridge will be analyzed and examined to insure minimal impacts to the existing morphology of the streambed at this location. Moreover, some select revetment is anticipated to be provided in this meander bend to provide for stable channel design. A smaller bridge structure is anticipated to span the main channel of the creek southwest of the school athletic facilities.

The intermittent UNT west of Liberty Drive would be relocated within the floodplain to the west of the proposed roadway rather than be conveyed through a culvert structure under the proposed roadway. The re-aligned stream channel would meander within the floodplain to the west and would tie into the main channel of Little Shoal Creek where it would flow under the proposed bridge structure southwest of the school athletic facilities. The meandering channel would provide some natural planform morphology, and some select revetment is anticipated to provide channel stabilization.

Under the Proposed Action, which avoids most of the floodway, impacts to the FEMA regulatory floodway and fringes are anticipated to be minimal. A criteria of "no-rise" in the regulatory Base Flood Elevation is being utilized for design constraints. The details of the preliminary hydraulic evaluation are included in Task Memorandum – Flintlock Road Overpass of I-35 – Liberty, MO: Little Shoal Creek Floodway Impacts: Drainage & Hydraulics Analysis, which is available upon request.

4. IMPACTS ON NATURAL AND BENEFICIAL FLOODPLAIN VALUES

The footprint of the roadway fill placed in the floodplain is minimal when compared to the total floodplain area. The proposed roadway would include four bridges and would be constructed to maintain 100-year floodway crossings free of significant hydraulic obstruction. Thus, long term, impacts on natural and beneficial floodplain values are anticipated to be minimal.

5. SUPPORT OF PROBABLE INCOMPATIBLE FLOODPLAIN DEVELOPMENT

The project corridor is within an urban/suburban, rapidly developing area. The Proposed Action parallels the floodplain of Little Shoal Creek which is on land owned by the Liberty Public School District #53, and will most likely remain undeveloped as shown on the future land use plan. It is unlikely that incompatible development would be encouraged by the construction of this project.

6. MEASURES TO MINIMIZE FLOODPLAIN IMPACTS AND MEASURES TO RESTORE AND PRESERVE THE NATURAL AND BENEFICIAL FLOODPLAIN VALUES

All practical measures to minimize impacts to the floodplain have been incorporated into the development of the Proposed Action as discussed in Chapter II – Alternatives Considered. The project construction will incorporate those features necessary to meet NFIP standards, and FEMA, SEMA and Clay County floodplain guidelines.

7. ONLY PRACTICABLE ALTERNATIVE FINDING

In order to provide travel lanes for the Flintlock Road overpass, it is necessary to locate the travel lanes within and through the floodplain of Little Shoal Creek and two of its tributaries. A total of 4.01 acres of floodplain would be affected by the Proposed Action (Alternative C). This Alternative was determined to provide the best solution to existing roadway deficiencies and future traffic volumes, to best accommodate community access and growth, and to have a low environmental impact.

The crossings of all floodways will be designed and constructed in compliance with applicable floodplain regulations, including Executive Order 11988. The design intent is to limit to "zero rise" in the base flood elevations attributable to implementation of the proposed roadway. During the design process, a detailed hydraulic analysis of the flows and water surface elevations will be made in accordance with the requirements of the Federal Emergency Management Agency and the U. S. Army Corps of Engineers. This analysis will ensure the absence of any encroachments upon regulatory floodways as well as avoid any adverse impacts. The proposed action will conform to applicable State of Missouri and local floodplain protection standards, and the required floodplain development permits will be obtained during the design phase.

Based upon the above considerations, and for the reasons stated in this Environmental Assessment, the Federal Highway Administration determines that the Proposed Action (Alternative C) is the only practicable alternative.

J. Biological Resources Impacts

Most of the area within the study corridor is comprised of undeveloped land in an urban setting, with remnant woodlands, and open pasture, and open utility corridors. The open pasture area in the northeast portion of the study corridor is composed of predominantly tall fescue with some little bluestem, and the open utility corridors contain a mixture of tall fescue and forbs. A diversity of wildlife also exists in the study corridor.

1. FOREST COMMUNITIES

The most dominant vegetative natural community occurring in the study corridor is the riparian forest in the floodplain of Little Shoal Creek, although it has been fragmented by clearing and utility corridor placement. Some of the tree types in the riparian forest include hackberry, sycamore, American elm, honey locust and shingle oak. There are also some areas of upland (oak-hickory) forest above the floodplain (see Exhibit II-1).

The importance of these wooded areas in protecting water resources from runoff, stabilizing stream banks, inhibiting soil erosion, providing aesthetic value, wildlife habitat, and plant and animal diversity is evident, especially in areas where much of the forest has been cleared for development purposes. In addition, these wooded areas are important wildlife migration corridors.

Forest Impacts

The No-Build Alternative would have no direct impact on the forested communities within the study corridor. Direct impacts to forested communities by the Proposed Action would occur where it is necessary to remove woodland vegetation for roadway and bridge construction. The majority of forest impacts would be at the edges of woodlands rather than fragmentation of contiguous habitats as most of the wooded areas have already been fragmented by development and utility corridor construction. Amounts of forest that would be removed by the Proposed Action include 4.75 acres of upland forest and 6.12 acres of riparian forest. Secondary impacts of forest removal are discussed under the "Wildlife Impacts" section of this chapter.

As mitigation for forest impacts, the cities of Kansas City and Liberty will consider incorporating tree plantings along the corridor where practicable. Tree species would be selected to complement and enhance the habitat and appearance of the affected areas.

2. HIGH QUALITY NATURAL COMMUNITIES

The Missouri Department of Conservation (MDC) has identified some high quality natural communities within the state that have been, for the most part, undisturbed and that possess defining characteristics of a specific type of natural community. These units have been located, mapped, and compiled in the MDC's Natural Heritage Database (NHD). According to the MDC (see Heritage Review Report dated May 12, 2005 in Appendix B), there are no significant natural communities located in the study corridor.

3. WILDLIFE

The study corridor is located in an urban area that is becoming rapidly developed, and the natural habitat that previously occurred has been disturbed. The most notable wildlife habitat considerations in this urban area are forested areas and riparian corridors associated with the Little Shoal Creek and its tributaries. Much of the forest in the area has been fragmented and cleared for development and utility corridor placement.

In general, some of the species of wildlife that have adapted to living in this type of environment include many species of birds, such as the northern cardinal (*Cardinalis cardinalis*), the mourning dove (*Zenaida macroura carolinensis*), the American goldfinch (*Carduelis tristis*), the blue jay (*Cyanocitta cristata*), the northern mockingbird (*Mimus polyglottos*), the American robin (*Turdus migratorius*), the American tree sparrow (*Spizella arborea*), the wood duck (*Aix sponsa*), the mallard duck (*Anas platyrhynchos*), the wild turkey (*Meleagris gallopavo silvestris*), the red-winged blackbird (*Agelaius phoenicus*), the downy woodpecker (*Picoides pubescens*), and the house wren (*Troglodytes aedon*).

Some of the mammals that have adapted to the area include the Virginia opossum (*Didelphis virginiana*), the striped skunk (*Mephitis mephitis*), the gray squirrel (*Sciurus carolinensis*), the eastern cottontail rabbit (*Sylvilagus floridanus*), the raccoon (*Procyon lotor hirtus*), the beaver (*Castor canadensis carolinensis)*, and the white-tailed deer (*Odocoileus virginianus*).

The Little Shoal Creek can provide habitat for some common fish species such as the creek chub (*Semotilus atromaculatus*), the bluntnose minnow (*Pimephales notatus*), the suckermouth minnow (*Phenacobius mirabilis*), and the green sunfish (*Lepomis cyanellus*). The damper environments in the study corridor can provide habitat for amphibians such as the eastern American toad (*Bufo americanus*), the southern leopard frog (*Rana sphenocephala*), western chorus frog (*Pseudacris triseriata*) and the eastern tiger salamander (*Ambystoma tigrinum*). Some of the reptiles include the ornate box turtle (*Terrapene ornata*), the five-lined skink (*Eumeces fasciatus*), the western slender glass lizard (*Ophisaurus attenuatus*) and the eastern hognose snake (*Heterodon platirhinos*).

Wildlife Impacts

Transportation improvement projects impact aquatic and terrestrial habitat directly through right-of-way acquisition and indirectly through habitat modification and fragmentation. Right-of-way acquisition results in a direct loss of acreage and a reduction in habitat size.

Streams and wetlands also provide habitat values and are considered in wildlife impacts. Not only do they serve as habitats for fish and some amphibious species, but they also provide drinking water for terrestrial wildlife. As discussed previously this chapter, impacts to the water resources in the study corridor would be minimal.

Only those species with a high tolerance of humans and development are those that survive and remain in this urban environment. The wildlife species currently present have adapted to living near humans in a developed environment and would attempt to relocate in response to the habitat impacts of any of the alternative improvements. However, some impacts could occur

because smaller, less mobile species may have difficulty moving to other areas with suitable habitat. Other species that are relatively mobile may also be impacted because suitable habitat in an urban area is scarce, and the wildlife population could be at or near carrying capacity. As a result, wildlife may have difficulty withstanding the loss of their limited habitat. In addition, the wildlife species within this urban corridor would continue to be subject to vehicle-induced mortality as they disperse to other areas at the outset of construction. There could also be a slight increase in wildlife mortality after construction, because of the addition of a new roadway. However, wildlife mortality could be minimized, as Little Shoal Creek and one of its tributaries would be bridged, thereby providing a means by which wildlife can safely migrate. Therefore, some impacts to wildlife could occur, although they would most likely be minimal because of the bridges, the remaining wooded areas and the remaining utility corridors with herbaceous vegetation.

4. THREATENED AND ENDANGERED SPECIES *(Federal and State Listed)*

Under the U.S. Endangered Species Act, the USFWS has primary responsibility in the protection of federally endangered and threatened species and designation of critical habitat areas for these species. All federally endangered and threatened plants and animals are protected by the Endangered Species Act of 1973 (ESA). The MDC determines species' state status in Missouri under constitutional authority (3CSR10-4.111 Endangered Species). Species that are listed in the Wildlife Code under 3CSR10-4.111 are protected by State Endangered Species Law 252.240.

Correspondence was conducted with the USFWS (see letter dated May 12, 2005 with response dated June 7, 2005, in Appendix B) concerning species listed as federally endangered or threatened that could occur in or near the study corridor. Correspondence was also conducted with the MDC (see Heritage Review Report dated May 12, 2005, in Appendix B) and information was obtained from the MDC's Natural Heritage Database concerning species that are state-endangered that could occur in or near the study corridor. Although there were no known locations, recorded occurrences or designated critical habitat of federal or state listed species within the study corridor, the MDC determined that the following federal endangered species could potentially occur in the area:

a. Indiana Bat (Myotis sodalis) *(Endangered on both the federal and state level)*

The Indiana bat occupies caves for hibernation in winter, but during spring and summer its maternity roost sites tend to be in living, injured (e.g. split trunks and broken limbs), dead or dying trees, greater than nine inches diameter at breast height (dbh) (optimally greater than 21 inches dbh) with loose exfoliating bark or cracks or cavities. Preferred roost trees are generally located in riparian and upland forest openings, at the forest edge, or where the overstory canopy allows some sunlight exposure to the roost tree, and usually within 0.6 miles (one kilometer) of water. Preferred foraging habitats during the spring and summer are streams associated with floodplain forests and ponds, reservoirs and wetlands. There are no known locations or recorded occurrences within the study corridor, however, suitable habitat exists in the wooded areas of the corridor. The USFWS has determined that during the summer months, the species has been more commonly found north of the Missouri River, and most of the winter hibernaculum are found south of the Missouri River.

Impacts – There are no known locations, recorded occurrences or designated critical habitat of the Indiana bat within or near the study corridor. The Proposed Action has been aligned to avoid as much of the floodway and floodplain as possible, thereby minimizing impacts to the wooded riparian areas. Most of the unavoidable impacts would be in areas that have already been fragmented by development and utility corridor placement, as the project is located within a rapidly developing urban area. Based on these factors, at this time this project is not likely to

have an adverse impact on the Indiana bat. The USFWS stated in their response (dated June 7, 2005), that Section 7 consultation is concluded.

b. Other Species

According to the MDC, state endangered grassland birds that could occur in the area include the northern harrier (*Circus cyaneus*), the greater prairie-chicken (*Tympanuchus cupido pinnatus*), and the barn owl (*Tyto alba*). Another grassland bird, the Henslow's sparrow (*Ammodramus henslowii*) is a Species of Conservation Concern that is considered imperiled in the state (S2 ranking). These birds prefer large, undisturbed areas of prairies, native grass plantings, and open pastures. There were no known locations, recorded occurrences or designated critical habitat of these species within the study corridor.

Impacts – There are no prairies or native grass plantings within the study corridor. The only open pasture is a relatively small (9-acre) isolated tract in the northeast corner of the study corridor, containing mostly tall fescue and smooth brome, with some scattered little bluestem. The pasture appears to be hayed and baled occasionally, as there is relatively little dead vegetation and accumulation of ground litter. Although this pasture would be fragmented by the Proposed Action, it is located in an urbanized area, and it is not anticipated that the aforementioned bird species would be adversely impacted by the project.

The Natural Heritage Database will be reviewed periodically during the project development process to identify any new locations of threatened or endangered species activity, or species of conservation concern.

K. Cultural Resources

1. INTRODUCTION

The proposed construction work on the Flintlock Road Overpass of I-35 could result in the inadvertent impaction (either through direct destruction or indirect visual impaction) of potentially significant cultural resources. Cultural resources include all prehistoric and historic sites, as well as architectural resources (such as buildings, structures, objects, and districts). Under eligibility criteria for the National Register of Historic Places, only those places associated with important persons or events in our history or prehistory, that exhibit unique architectural features, or which could provide valuable new information for understanding past behavior are deemed significant (National Register 1990). The cultural resources investigations were performed according to the Scope of Services prepared by MoDOT. The cultural resources investigations consisted of an archival search, an architectural survey and archaeological evaluation.

2. PREVIOUS INVESTIGATIONS

The area of potential effects (APE) was determined based on current MoDOT standards for cultural resources investigations. The APE includes an area approximately 1.5 miles long and 800 feet wide and is shown on Exhibit II-1. The APE was developed by overlaying the various proposed alignments and then going beyond the limits of the composite alternatives by 100 feet. Regardless of the alignment selected, it would be included in the APE of the Flintlock Road Overpass project.

An archival search was conducted prior to field work to identify any previously recorded cultural resources and to determine the present state of knowledge concerning the history of the area. The boundaries of the archival search encompassed a one-mile radius around the proposed APE. Information obtained from this archival search will be used to assist with project planning by identifying known cultural resources and by providing a context from which to evaluate the significance of any resources identified.

Archival information was obtained from the Missouri Historical Society in St. Louis, Clay County Archives and Historical Library, and Missouri Department of Natural Resources – State Historic Preservation Office.

The archives at the Missouri Department of Natural Resources – State Historic Preservation Office (SHPO) were examined in order to determine if any previously recorded cultural resources had been identified within the project area. In order to better understand present knowledge of cultural resources of the region, reports concerning cultural resource investigations within a one-mile radius around the proposed APE for the Flintlock Overpass of Interstate 35 were investigated. The archives revealed that three archaeological surveys were conducted within the Flintlock Road Overpass APE and one survey within one mile of the APE.

Two surveys for sewer projects, Survey No. CL-081 (within one mile of the APE), and Survey No. CL-096 were undertaken in December 1996 and February 1999 respectively. Project clearances were recommended (Sturdevant, 1996, 1999).

In April and May of 2003, Survey CL-140, the archaeological survey for the South Liberty Roadway project, was performed prior to improvements made to adjacent roads, which included Flintlock Road, Hughes Road, and Withers Road. The survey uncovered five prehistoric isolated finds and eight previously unrecorded archaeological sites, none of which were in the Flintlock Road Overpass APE (Gannon 2004).

Survey No. CL-142 was undertaken in May 2003. This survey covered a total of six acres and was conducted in order to replace two bridges on NE 76th Street, channelize a creek, and expand 0.3 miles of NE 76th Street. The two bridges, located within the Flintlock Road APE, were non-trussed pre-stressed concrete and were constructed in 1960. No cultural resources that were eligible for the National Register were located and project clearance was recommended (Dycus 2003).

In addition to the professional surveys performed in the area, a group of volunteers conducted an amateur archaeological dig between the South Valley Middle School track and the wooded area adjacent to Little Shoal Creek. The excavation began due to the presence of a piece of limestone sticking out of the ground. As the excavation progressed, the limestone took form as a wall with two walls extending from it at right angles. It was initially thought that the structure was associated with the cemetery documented through oral history. Later, it was speculated that the limestone was a foundation for a mill, but ultimately the structure was determined to be part of a retaining wall to stop soil erosion (Clay County Archives and Historical Library nd). The latter interpretation corresponds with the history of the area and the field findings from the current survey. A sketch plan view and profile were drawn for the wall and several photos of the excavation were taken, but no field notes were recorded. Based on the drawings, the wall appears to be about four feet tall and 21.7 feet long. According to Kevin Fisher (2005), one of the volunteer excavators, some of the dirt was screened, but no artifacts were found. Fisher's opinion was that the wall was constructed by the Civilian Conservation Corps (CCC) as part of the soil erosion prevention program conducted in Clay County in the 1930s. The excavated area was refilled after the volunteer's efforts were concluded. There was no funding or state approval for the amateur dig and a professional report was never written.

The Clay County Archives and Historical Library documented a family cemetery being located on the property presently occupied by the South Valley Middle School. The cemetery's location, based on the oral description of an area resident, was near the area of the Middle School Track. The Clay County Archives and Historical Library was unable to obtain corroboration of the family cemetery from other local residents or locate it on any of the maps in the Archives. Shovel

testing during the June 28 field survey of the area yielded disturbed soils and no artifacts or indicators of the family cemetery. The only undisturbed areas were the steep slopes adjacent to Little Shoal Creek, a location which would have been unsuitable for a family cemetery. During construction, the project area near the Middle School Track will be monitored, and if cultural materials or human remains are encountered, work will cease in that area and local law enforcement will be notified as per the regulations of Chapter 194 (Unmarked Human Burial Law) of the Missouri Revised Statutes.

3. ARCHAEOLOGICAL SURVEY

A cultural resource survey was performed within the APE of the proposed Flintlock Overpass of I-35 in order to identify any archaeological resources that may exist and to determine the potential significance of these resources. Field investigations, involving pedestrian survey, shovel testing, and augering within the APE were conducted on June 28, 2005 by Archeological Research Center of St. Louis, Inc. (ARC). All artifacts found during the survey were collected. The entire APE was surveyed except for one property where the landowner initially denied access for the survey. Since that time, the property owner allowed the survey to take place and the property was surveyed by ARC on November 7, 2005. The archaeological survey located both Site 23CL1453 and the previously located masonry structure. Shovel tests of the area at the previously located masonry structure did not yield any artifacts. Very few artifacts were recovered at Site 23CL1453.

4. ARCHITECTURAL SURVEY

An architectural survey was completed to identify and document all architectural resources within the APE. Since none of the properties within the APE are older than 50 years, State Historic Preservation Office Architectural/Historic Inventory Forms were not completed. All properties are represented through streetscape photographs. The results of that survey are as follows:

- *Northland Church Partnership Property* – brick office building and truck paint shop less than 50 years old. West side of Church Road, north side of NE 76th Street in Kansas City, MO.

- *Leroy Lawrence Wade Jr. and Philip M. Wade Property* – fenced, graveled truck parking lot. West side of Church Road, south side of NE 76th Street in Kansas City MO.

- *Oak Crest Development* – rental apartments and duplexes less than 50 years of age. West side of Church Road, south of North Lane, Kansas City MO.

- *The Liberty Public School District #53* – South Valley Middle and Junior High School buildings, and athletic fields are less than five years old. West side of North side of Liberty Drive, west of Mid Jay Drive, Liberty MO.

- *Bent Oaks Subdivision* – a small portion of the subdivision is within the APE. Homes are less than 20 years old. East side of Liberty Drive, Liberty MO.

- *Highway Properties LLC* – Havens Construction Company office building is less than 10 years old. West side of Liberty Drive, Pleasant Valley MO.

- *Department of Social Services Building* – Building is less than 10 years old. West side of Liberty Drive, Pleasant Valley MO.

- *Central Detroit Diesel-Allison* – The industrial building is less than 50 years old. North side of Liberty Drive, Pleasant Valley MO.

- *Two bridges on NE 76th Street* – These two bridges are non-trussed pre-stressed concrete and are less than 50 years old (constructed in 1960). They were included in a previous investigation (Survey No. CL-142) that was undertaken in May 2003.

5. RESULTS

As a result of the cultural resource survey for the proposed Flintlock Road Overpass of I-35, one historic archaeological site, 23CL1453, and one historic masonry structure were recorded.

Site 23CL1453 represents the remains of a 20th century outbuilding. This outbuilding is not associated with a residence, and very few artifacts were recovered during the survey. The site is located on a slope and shovel tests revealed shallow topsoil, less than ten centimeters, at this site.

The masonry structure could have been constructed by the Civilian Conservation Corps during the 1930s as part of farmland restoration projects that were being undertaken throughout Clay County. A thorough review of available documents from the National Archives at Kansas City, Chicago and Archives in St. Louis, records of CCC Company 1728C on file at the Clay County Archives and Historical Library, the Missouri Historical Society in St. Louis, Kansas City Public Library and National Association of the Civilian Conservation Corps Alumni Museum Research Library was unable to reveal any direct evidence that positively identified this masonry wall as one of the soil erosion control structures built by CCC Company 1728C or as it also referred to Camp PE-73. The masonry wall's location and design are of a type and style similar to that built by CCC Company 1728C/Camp PE-73 during the 1930s at over 100 farms in Clay County MO.

6. ELIGIBILITY CRITERIA

The determination of a cultural resource's significance is predicated on criteria established for nominating properties to the National Register of Historic Places. These criteria state that (Federal Register 1974:5907):

> *The quality of significance in American history, architecture, archaeology, and culture are present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and;*
>
> *(a) That are associated with events that have made a significant contribution to the broad patterns of our history; or*
> *(b) That are associated with the lives of persons significant in our past; or*
>
> *(c) That embody distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or*
>
> *(d) That have yielded, or may be likely to yield, information important in history or prehistory.*

Locations known or suspected to have unmarked human remains are also protected by state statutes RSMo 194.400-401 and by the Native American Graves Protection and Repatriation Act of 1990.

7. SUMMARY AND RECOMMENDATIONS

Site 23CL1453 consists of the concrete block foundation of an outbuilding constructed after 1935. This outbuilding is not associated with a residence, and very few artifacts were recovered during the survey. Due to the scarcity of artifacts and the relatively late date of this site, the SHPO has determined that it is not eligible for the National Register (see letter dated November 17, 2005 in Appendix B). No further archaeological testing is recommended.

The masonry structure located on the Liberty Public School District Property was probably built by the CCC as part of a soil erosion prevention program, although no documentation was found during the archival search to directly link this structure to CCC Company 1728C or Camp PE-73. If it was built by the CCC, it would be one of more than a hundred such masonry structures built in Clay County as a result of this program. The excavation undertaken by the Clay County Historical Society noted initials inscribed on the wall "Wm.B." which does correspond to a member of the CCC Company 1728C, William Burkett. He was on the company roster in 1934, an appropriate time frame for the construction of the soil erosion control structure. The limestone and cement wall is not of exceptional design or of unique style. The SHPO has determined that it is not eligible for the National Register (see letter dated November 17, 2005 in Appendix B).

All of the buildings recorded within the APE during the cultural resource survey of the proposed Flintlock Road Overpass of I-35 were less than 50 years old. None of these buildings are recommended as eligible for the National Register. The two bridges on NE 76th Street (non-trussed, pre-stressed concrete) are less than 50 years old and were determined to be not eligible for the National Register in a previous investigation (Survey No. CL-142 – Dycus, 2003).

L. Hazardous Material Impacts

1. SURVEY METHODOLOGY

A Phase I hazardous waste assessment was performed to identify sites within the Study Corridor that are contaminated or potentially contaminated with hazardous materials or waste. Sites containing excessive solid waste were also screened.

The hazardous waste assessment for the study corridor involved extensive data collection efforts, including review of numerous government agency lists and files, review of current aerial photographs, and a field reconnaissance of the study corridor. The documents reviewed include the following: Federal (EPA) and State (MDNR) computer database search provided by Environmental Data Resources, Inc. (EDR) July, 2005 (results available upon request); EPA Region VII files, Kansas City, Kansas (see e-mail dated June 22, 2005 in Appendix B); and MDNR Central office correspondence (see letter dated August 2, 2005 in Appendix B). The Flintlock Overpass Over I-35 Hazardous Material Screening Report is available upon request and includes a list of federal and state databases and a summary of the database search.

In addition, a field reconnaissance was performed, which included a visual inspection of the general study area to identify additional sites that could contain hazardous wastes, but may not have been recorded.

2. POTENTIAL HAZARDOUS WASTE SITES

The Phase I hazardous waste assessment identified eight records/facilities within a one-mile radius of the study corridor, six of which were located within ¼ mile of the study corridor. However, there are only two identified hazardous waste site properties, representing four records, immediately adjacent to the study corridor (see Table III-10 and Exhibits II-1 and II-8). No sites were documented as serious environmental hazards believed to require extensive time and cost to clean up.

One property, representing three records, is located at the far northeast corner of the study corridor, north of NE 76th Street and west of the I-35 frontage road (7600 N. Church Road). One record is for an RCRA (Resource Conservation and Recovery Act) small generator of hazardous waste of the Boulevard Truck Sales and Service business. The second record is for a leaking underground storage tank (LUST) of the Jay Truck Driver Training Center (it was

removed in 1990), and the third is for an in-service underground storage tank (UST) of the Jay Truck Driver Training Center. Those two businesses are no longer at that address.

The second property is located at the south end of the study corridor, at the northwest corner of Liberty Drive and W Liberty Drive (9200 Liberty Drive), and is listed as a leaking underground storage tank (LUST) of the Central Power Products business (currently Central Detroit Diesel-Allison), although it was removed in 1991.

Table III-10: Potential Hazardous Waste Sites within Study Corridor

Site No.	Site Name	Site Location	Federal/State Program List	Comments	Potential for Contamination
1	Boulevard Truck Sales & Service	7600 N. Church Rd.	RCRA-SQG	No longer at this address	Low
2	Jay Truck Driver Training Center	7600 Church Rd.	LUST	LUST – Removed – Clean-up completed 1990. No longer at this address	Low
2	Jay Truck Driver Training Center	7600 Church Rd.	UST	UST – In service. No longer at this address	Low
3	Central Power Products	9200 Liberty Dr.	LUST	LUST – Removed – Clean-up completed 1991. Currently Detroit Diesel-Allison	Low

3. IMPACTS

The sites and their associated facilities shown in Table III-10 are screened as having a low potential for contamination and none of the sites would be impacted by the Proposed Action.

All known and unknown hazardous waste impacts encountered during roadway improvements would be handled per federal, state, and local laws and regulations. If an unknown site is encountered during construction, the local public works department and the Missouri Department of Natural Resources (MDNR) must be contacted and appropriate laws and EPA regulations would be followed to eliminate or minimize any adverse environmental consequences. In the event that randomly dumped solid waste is encountered in the fields and ravines, proper procedures warrant collecting the material and properly disposing of it in a landfill.

Standard practices should be used for demolition, clearing and grubbing. Although no structures were identified to be demolished for this project, if homes and businesses cannot be avoided because of project design, thorough inspections for hazardous materials are recommended. The inspections should cover both stored hazardous materials, and hazardous materials used in the construction of the building (i.e. asbestos, etc.). Where evidence of improper waste handling practices is discovered, soil and/or groundwater sampling may be recommended during final design or pre-construction phases (Phase I and Phase II assessments).

Where electrical transmission lines, telephone facilities, pipelines, and other utilities are encountered or removed for the proposed project, coordination with the applicable utility companies is recommended to identify chemical hazards present at specific locations. Further investigations may be required during final design based upon site specific data from the utility companies. Typically substations and intermittent power pole locations house transformers that may or may not contain Polychlorinated Biphenyls (PCBs). When this situation is involved with construction, further consideration may be necessary to include soil testing for PCBs near transformers.

Where hazardous material or solid waste is identified in the additional required right-of-way, resolution with the property owner is recommended prior to purchase.

M. Air Quality Impacts

1. EXISTING AIR QUALITY

The Federal Clean Air Act Amendments (CAAA) of 1970 required the adoption of air quality standards. These were established to protect public health, safety and welfare from known or anticipated effects of sulfur dioxide (SO_2), particulates (PM_{10}, 10 microns and smaller; $PM_{2.5}$, 2.5 microns and smaller), carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (0_3), and lead (Pb). In addition to these pollutants, the State of Missouri has established additional criteria for hydrogen sulfide (H_2S) and sulfuric acid (H_2S0_4). The Missouri and National Ambient Air Quality Standards (NAAQS) for these pollutants are listed in Table III-11.

Table III-11: Missouri and National Ambient Air Quality Standards

Pollutant	Averaging Time	Standard Value	Standard Type
Ozone (O_3)	Eight Hour(1)	0.08 ppm (157 μg/m^3)	Primary & Secondary
Carbon Monoxide (CO)	One Hour(2) Eight Hour(2)	9 ppm (10 mg/m^3) 35 ppm (40 mg/m^3)	Primary Primary
Nitrogen Dioxide (NO2)	Annual Arithmetic Mean	0.053 ppm (100 μg/m^3)	Primary & Secondary
Particulate (PM_{10})	Annual Arithmetic Mean 24-hour average	50 μg/m^3 150 μg/m^3	Primary & Secondary Primary & Secondary
Particulate ($PM_{2.5}$)	Annual Arithmetic Mean 24-hour average(3)	15 μg/m^3 65 μg/m^3	Primary & Secondary Primary & Secondary
Lead (Pb)	Quarterly average	1.5 μg/m^3	Primary & Secondary
Sulfur Dioxide (SO2)	Annual Arithmetic Mean 24-hour average(2) 3-hour average(2)	0.03 ppm (80 μg/m^3) 0.14 ppm (365 μg/m^3) 0.50 ppm (1300 μg/m^3)	Primary Primary Secondary
Hydrogen Sulfide (H2S)(4)	One-half Hour(5) One-half Hour(6)	70 μg/m^3 (0.05 ppm) 42 μg/m^3 (0.03 ppm)	
Sulfuric Acid (H_2SO_4)(4)	Twenty-four Hour(7) One Hour(8)	10 μg/m^3 30 μg/m^3	

Source: Code of Federal Regulations; Title 40 Part 50: Revised July 2004 and Missouri 10 CSR 10 – 6.010 Ambient Air Quality Standards
(1) The 8-hour primary and secondary standards are met when the 3-year average of the 4th highest average concentration is less than or equal to 0.085 ppm.
(2) Not to be exceeded more than once per year.
(3) Statistically estimated number of days with exceedances is not to be more than 1 per year.
(4) Missouri Air Quality Standards.
(5) Not to be exceeded more than twice per year.
(6) Not to be exceeded more than twice in any five consecutive days.
(7) Not to be exceeded more than once in any ninety consecutive days.
(8) Not to be exceeded more than once in any two consecutive days.
ppm – parts per million parts of air (by volume) at 25°C
μg/m^3 – micrograms of pollutant per cubic meter of air
mg/m^3 – milligrams of pollutant per cubic meter of air

The CAAA of 1977 required all states to submit to the U.S. Environmental Protection Agency (EPA) a list identifying those air quality control regions, or portions thereof, which meet or exceed the NAAQS or cannot be classified because of insufficient data. Portions of air quality control regions that are shown, by monitored data or air quality modeling, to exceed the NAAQS for any criteria pollutant are designated "non-attainment" areas for that pollutant.

The Flintlock Overpass project is located within the Metropolitan Kansas City Interstate Air Quality Control Region (Missouri – Kansas) (AQCR #94). The Kansas City Metropolitan Area, Clay and Jackson counties, is currently in attainment status for all criteria pollutants.

A Regional Clean Air Action Plan is being formulated that will contain formal commitments from area governments and businesses to voluntarily reduce ozone-forming emissions, both in the short and long term. Commitments will specify the level of emissions reductions anticipated and

dates by which the reductions will occur. The plan will also contain a regional consensus position about regulatory controls that would be implemented if the region were to become a non-attainment area. This plan is being prepared to ensure continued compliance with the 8-hour ozone standard

2. FUTURE AIR QUALITY

The MoDOT, FHWA and MDNR executed an Air Quality Analysis Agreement in March 1988 that states that a detailed air quality analysis on federally funded highway projects will be included in an environmental document when the present or predicted ADT volume on the project exceeds 54,000 vehicles in the year of project construction or 72,200 vehicles in the 20th year following the project construction. Since the opening year ADT on the Flintlock Overpass and the ADT for the 20th year following the project construction are 7,500 and 36,000 ADT respectively, no air quality analysis has been prepared for this project.

The Flintlock Overpass project, Transportation Improvement Program (TIP) # 520041 is included in the FY 2004-2007 TIP endorsed by MARC, the Metropolitan Planning Organization (MPO) for the region in which the project is located. Projects in the TIP are considered to be consistent with the 2030 regional transportation plan endorsed by MARC.

In January 2003, the FHWA and the Federal Transit Administration (FTA) determined that the 2030 regional transportation plan conforms with the State Implementation Plan (SIP) and the transportation-related requirements of the 1990 Clean Air Act Amendments. On January 6, 2004, the FHWA and the FTA determined that the TIP also conforms with the SIP and the Clean Air Act Amendments. These findings were in accordance with 40 CFR Part 93, “Criteria and Procedures for Determining Conformity to State or Federal Implementation Plans of Transportation Plans, Programs, and Projects Funded or Approved Under Title 23 USC or the Federal Transit Act.”

The project’s design concept and scope are consistent with the project information used for the TIP conformity analysis. According to MARC, the Flintlock Overpass project is part of an existing conformity plan and would not be affected by the implementation policy for the new 8-hour Ozone standard.

N. Noise Impacts

1. NOISE ABATEMENT CRITERIA

The FHWA's Noise Abatement Criteria (NAC) and MoDOT’s FHWA approved interpretation of the NAC, as detailed in MoDOT’s Traffic Noise Policy[1], were used in the analysis of the acoustic impact of the proposed project. The analysis was conducted according to the guidelines as presented in the Code of Regulation, Title 23 Part 772, which provides procedures whereby the acoustic impact of the Proposed Action can be assessed and the needs for abatement measures determined. The FHWA and MoDOT’s NAC for various land uses are presented in Table III-12. The noise level descriptor used is the equivalent sound level, $L_{eq}(h)$, defined as the steady state sound level in a one hour period which contains the same sound energy as the actual time-varying sound.

Noise mitigation measures for traffic noise impacts will be considered when the predicted noise levels approach or exceed those values shown for the appropriate activity category of the FHWA Noise Abatement Criteria, Table III-12, or when the predicted traffic noise levels substantially exceed the existing noise levels.

[1] Traffic Noise Policy, Missouri Department of Transportation, MoDOT Preliminary Studies Group, Environmental Section, September 1997.

MoDOT has defined the NAC approach or exceed criteria for Activity Category B as being equal to or greater than 66 dBA $L_{eq}(h)$ for noise sensitive receptors such as residences, churches, schools, libraries, hospitals, nursing homes, apartment buildings, condominiums, etc. The criteria for Activity Category C is 71 dBA $L_{eq}(h)$ or greater. MoDOT has defined an increase of 15 decibels or more over the existing noise as being substantial. Title 23 CFR, Section 772.11(a) states, "In determining and abating traffic noise impacts, primary consideration is to be given to exterior areas. Abatement will usually be necessary only where frequent human use occurs and lower noise level would be of benefit."

Table III-12: Noise Abatement Criteria
Hourly A-Weighted Sound Level-Decibels (dBA)

Activity Category	$L_{eq}(h)$ (1 Hr)	Description of Activity Category / Land Uses
A	57 dBA (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the lands are to continue to serve their intended purpose.
B	67 dBA (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries and hospitals.
C	72 dBA (Exterior)	Developed lands, properties or activities not included in Categories A or B above.
D	---	Undeveloped lands.
E	52 dBA (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals and auditoriums.

Source: Code of Federal Regulations, Title 23 Part 772, Revised April 2005
MoDOT Traffic Noise Policy, September 1997

2. TRAFFIC NOISE MODELING

The FHWA Traffic Noise Model, (TNM® 2.5)[2] was used to model existing 2005 and design year 2030 L_{eq} noise levels. The design year noise levels were compared to the existing noise levels and to the NAC, Table 1. The design year noise levels were also used in the noise mitigation analysis to analyze the feasibility of abatement measures for locations projected to experience a noise impact. Inputs such as volume, speed, and truck percentages were modeled to reflect the traffic characteristics "which yield the worst hourly traffic noise impact on a regular basis for the design year…"[3]. The following parameters were used in this model to calculate an hourly $L_{eq}(h)$ at a specific receiver location:

- Distance between roadway and receiver;
- Relative elevations between roadway and receiver;
- Hourly traffic volumes for light-duty (two axles, four tires), medium-duty (two axles, six tires), and heavy-duty (three or more axles) vehicles;
- Vehicle speed;
- Roadway grade; and
- Topographic features, including retaining walls and berms.

[2] Michael C. Lau, Cynthia S. Y. Lee, Gregg G. Judith L. Rochat, Eric R. Boeker, and Gregg C. Fleming. FHWA Traffic Noise Model® Users Guide (Version 2.5 Addendum). Federal Highway Administration, April 2004.
[3] 23 CFR, Section 772.17(b).

Twenty-six (26) noise modeling receptors were identified to represent 27 residences (single family and multi-family), two (2) schools, two (2) locations on school athletic fields, a tennis court, a swimming pool and four (4) commercial establishments. The location of the modeling receptors are shown on Exhibits II-1 and II-8.

Future 2030 design hour traffic data were used to model the design year $L_{eq}(h)$ noise levels. These noise levels were compared to the existing noise levels to determine if MoDOT's 15 decibel increase criteria would be exceeded and to the NAC noise levels in Table III-12. Exceeding either criterion is, by definition, an impact. Mitigation measures must be reviewed when an impact has been identified to determine if the measures are both feasible and reasonable. Design year $L_{eq}(h)$ noise levels at the residences, school grounds and recreation areas along the proposed Flintlock Overpass ranged from 56 – 65 dBA $L_{eq}(h)$. Design year $L_{eq}(h)$ noise levels at the commercial establishments ranged from 62 to 69 dBA $L_{eq}(h)$. None of these noise levels exceed the NAC. The results of the peak hour traffic noise modeling at each modeling receptor are presented in Table III-13.

Table III-13: Design Hour Noise Levels, dBA $L_{eq}(h)$

Receiver I.D.[1]	Land Use[2]	# of Units	NAC Category	Noise Level, dBA $L_{eq}(h)$			2030 dB Increase over Existing	Impact[3]
				NAC Level	Existing (2005)	2030 Build without Noise Walls		
N1	Rec Area	1	B	67	59	61	N1	Rec Area
N2	Com	1	C	72	55	62	N2	Com
N3	Com	1	C	72	61	68	N3	Com
N4	Com	1	C	72	62	69	N4	Com
N5	Res	1	B	67	60	64	N5	Res
N6	Res	1	B	67	60	63	N6	Res
N7	Res	1	B	67	59	64	N7	Res
N8	Res	1	B	67	62	65	N8	Res
N9	Res	1	B	67	61	64	N9	Res
N10	Res	1	B	67	60	61	N10	Res
N11	Res	1	B	67	56	58	N11	Res
N12	Res	1	B	67	54	57	N12	Res
N13	Res	1	B	67	55	57	N13	Res
N14	Res	1	B	67	63	64	N14	Res
N15	Res	1	B	67	57	59	N15	Res
N16	Res	4	B	67	60	63	N16	Res
N17	School	1	B	67	52	56	N17	School
N18	School	1	B	67	57	61	N18	School
N19	Sch Field	1	B	67	57	63	N19	Sch Field
N20	Sch Field	1	B	67	61	63	N20	Sch Field
N21	Com	1	C	72	64	67	N21	Com
N22	Res	2	B	67	51	56	N22	Res
N23	Res	5	B	67	52	60	N23	Res
N24	Res	3	B	67	50	56	N24	Res
N25	Apts	2	B	67	54	60	N25	Apts
N26	Rec Area	1	B	67	53	59	N26	Rec Area

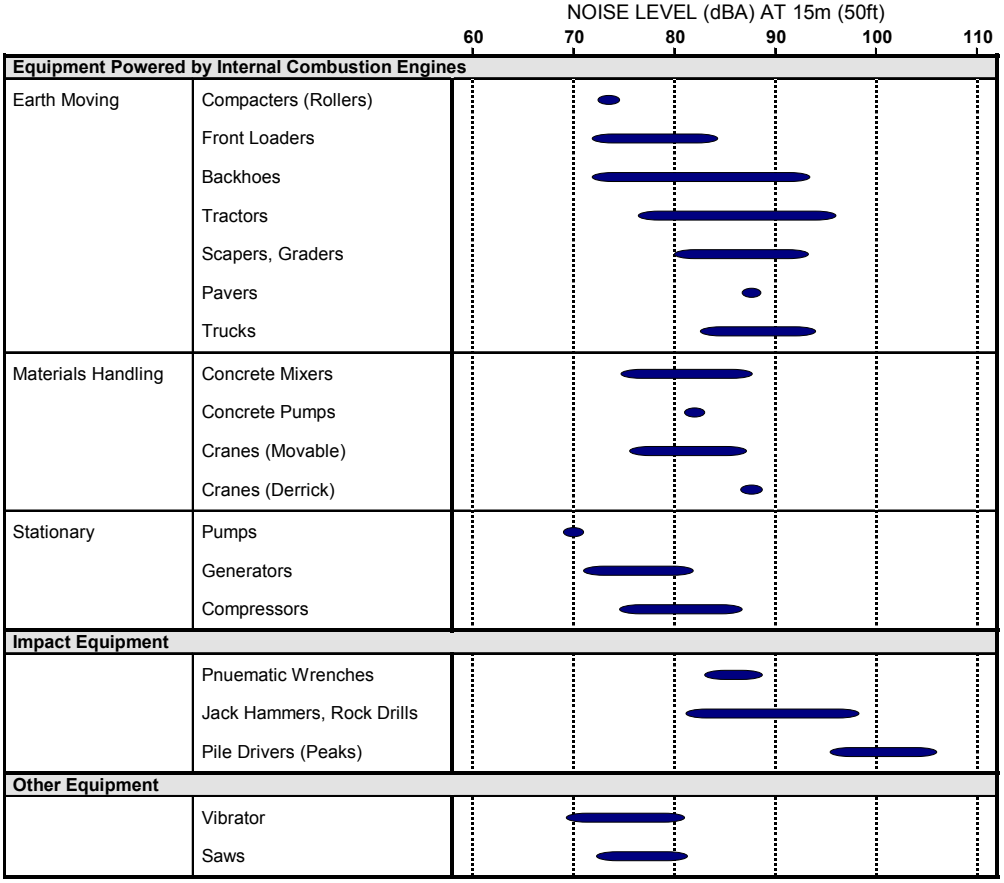
(1) Receiver Numbers on Exhibits II-1 and II-8.
(2) Res – Residence, Apts – Apartments, Com. – Commercial
(3) Y = Impact, N = No Impact

3. CONSTRUCTION NOISE

As directed by 23 CFR 772.19, the effects of the temporary increased noise levels during construction were considered. These noise impacts will occur within the immediate vicinity of the construction activities and generally be limited to working hours. Although noise impacts during project construction are of short duration, a large number of combustion engine powered equipment will be required to construct the proposed roadway. This equipment is expected to be

the main contributor to the sound levels from highway construction. Table III-14 lists some typical peak operating noise levels at a distance of 50 feet, grouping construction equipment according to mobility and operating characteristics.

Table III-14: Construction Equipment Sound Levels



SOURCE: U.S. Report to the President and Congress on Noise, February, 1972.

The major construction elements of this project are expected to be earth removal, hauling, grading and paving. General construction impacts such as temporary speech interference for passerby and those individuals living and working near the project can be expected, particularly from earth moving equipment during grading operations. Overall, construction noise impacts are expected to be minimal since construction noise is relatively short in durations.

4. UNDEVELOPED LANDS

The 66 dBA $L_{eq}(h)$ setback distance along the proposed Flintlock Overpass would range from 92 feet to 150 feet. The range of distances are a function of traffic volumes and roadway elevation adjacent to the vacant lands. Dividing the project into sections; the north south segment of Liberty Drive, Flintlock Road from Liberty Drive to NE 76th Street, and Flintlock Drive from NE 76th to NE 79th Streets, the setback distances would be 105 feet, 150 feet and 92 feet, respectively. The setback distance indicates that noise levels within the setback distance, measured perpendicular to the centerline in either direction, is 66 dBA $L_{eq}(h)$ or greater. This setback distance was developed to assist local planning authorities in developing land use control over the remaining undeveloped lands along the project in order to prevent further development of incompatible land use.

5. CONCLUSION

Based on the study completed, noise mitigation is not necessary. If substantial changes in horizontal or vertical alignment occur during the remaining stages of design and construction, noise abatement measures will be reviewed. A final Noise Report will be prepared if needed during final design and following all receipt of public comments.

O. Visual and Aesthetic Impacts

1. EXISTING VISUAL ENVIRONMENT

The majority of the area within the study corridor is a wooded riparian corridor along Little Shoal Creek, although some of the wooded area has been cleared for the purpose of utility easements (power lines and sanitary sewer). The adjacent area consists of residential, institutional, and commercial development. Most of the development is relatively new, and some of the remaining undeveloped areas will become developed in the near future.

Within the study corridor, the only notable visual resource that is scenically significant is the Little Shoal Creek riparian corridor. Although the riparian area has been segmented by tree clearing for utility easements, the characteristics of the stream and the adjacent riparian woodland still contribute to the visual identity of the environment and provide a sharp contrast with the rapidly developing urban environment.

2. VISUAL IMPACTS

Visual quality impacts are determined by the degree of change in the visual environment as related to viewer response. For the purpose of highway project assessment, there are two distinct categories of viewers or viewer response to be considered in regard to the visual environment: viewers who are users of the project facility (views *from* the road), and people who can observe the roadway from an adjacent vantage point (views *of* the road).

a. No-Build Alternative

The No-Build Alternative would not physically alter the existing environment or visual quality of the environment.

b. Proposed Action (Build Alternative)

The Proposed Action would have the following impacts:

Views FROM the Road

The most notable high quality views *from* the road would occur in the areas where the new roadway parallels the Little Shoal Creek riparian corridor, on the east side of I-35.

Views OF the Road and Visual Quality Impacts

The existing visual environment is of high quality along the Little Shoal Creek riparian area, however, the Proposed Action would have an overall moderate visual impact on this environment. The visual "change" would be moderate since the new roadway would be on the east edge of the riparian corridor which has already been altered by tree clearing for utility easements. Views *of* the road would occur from the South Valley Middle School and Junior High School athletic facilities as the roadway passes close to the west edge of those facilities where no road has previously existed. At the residential area on the east side of Liberty Drive, sensitive visual receptors would have views *of* the road similar to existing conditions. The views *of* the road from these residences would not be substantially different than those to which they

have been accustomed, since the widening of Liberty Drive would take place on the opposite (west) side of the existing roadway. Views *of* the road from other residential areas (residences on the west side of I-35 and the trailer court) are distant and are blocked by existing trees.

3. AESTHETIC CONSIDERATIONS / VISUAL ENHANCEMENTS

In areas where the roadway is visible to residences and the school athletic facilities, if practicable, landscaping with evergreen trees and shrubs could help to screen and soften the views *of* the road in addition to providing enhanced views *from* the road. Where appropriate and practicable, the cities of Kansas City and Liberty will consider incorporating landscaping and aesthetic design elements in the design phase of the project, and in an integrated fashion to ensure that the roadway and bridge improvements will visually complement the character of the study corridor.

P. Permits

Permits applicable to the Proposed Action may be categorized into two groups: regulatory permits and construction permits. Regulatory permits assist government agencies in the administration and implementation of federal, state or local statutes or initiatives. These permit programs are processed through planning and design phases of the Proposed Action. Construction permits serve as regulators of construction activities to protect the adjacent environs. State or local government agencies typically operate roadway construction permit programs.

1. REGULATORY PERMITS

a. Sections 404 (USACE) and 401 (MDNR) of the Clean Water Act

Section 404 of the Clean Water Act prohibits the discharge of dredged or fill material into “waters of the U.S.” unless exempted or authorized by the US Army Corps of Engineers (USACE). Section 404 is the primary Federal statute that implements federal regulatory policies concerning the protection of wetlands as specified in various orders and regulations. The USACE, Kansas City District, has an agreement with the Missouri Department of Natural Resources to process requests for Section 401 water quality certifications jointly with the Section 404 permit application. Specific conditions of Section 401 Water Quality Certification also become conditions of the Section 404 permit.

Based on map review and field reconnaissance, it was determined that “waters of the U.S.” are present in the study corridor. “Waters of the U.S.” include streams, ponds (if connected to “waters of the U.S.”), wetlands, and other special aquatic sites. The only “waters of the U.S.” impacted by the Proposed Action are the streams that would be crossed. Any dredge of fill activities in these streams would require a Section 404 permit from the USACE.

Under certain specific circumstances, a project may qualify for authorization by a Section 404 Nationwide Permit. A Nationwide Permit is a form of general permit which authorizes a category of minor activities throughout the nation and allows those activities to occur with little, if any, delays or paperwork. Nationwide Permit number 14 authorizes discharges in “waters of the U.S.” as a result of linear transportation stream crossings if the loss of surface area of water resources is less than ½ acre.

b. NPDES Permit

The National Pollutant Discharge Elimination System (NPDES) permit (Section 402 of the federal Clean Water Act and the Missouri Clean Water Act), administered by MDNR, requires that slopes and ditches be properly designed to prohibit or reduce erosion. The application for this permit will be done at the same time as the Section 404 Permit application.

c. Floodplain Development Permits

Portions of the Proposed Action of this project occur in areas that are designated by FEMA as Special Flood Hazard Areas (SFHA). The State of Missouri is a participant in the National Flood Insurance Program (NFIP), and any development associated with this project that occurs within a SFHA must meet the requirements of the State of Missouri Executive Order 98-03. This requires obtaining a floodplain development permit from SEMA prior to construction or development. In addition, some portions of the Proposed Action occur within a regulatory floodway, and as such, a "No-Rise" certificate and statements as to the effects of possible flooding are required. The municipalities are responsible for providing a no-rise certificate to SEMA prior to its issuance of the Floodplain Development Permit for the project, which will occur during the design phase. In addition, a hydraulic study will be required that will show that there are no effects on the floodway elevations.

2. CONSTRUCTION PERMITS

In order to protect the adjacent environment from sedimentation and construction material pollutants discharged from construction activities, erosion and sedimentation control procedures and specifications (BMPs) will be utilized for the highway construction. This will satisfy the requirement for a National Pollutant Discharge Elimination System (NPDES) permit, Section 402 of the federal Clean Water Act and the Missouri Clean Water Act.

Other construction related permits could include temporary batch-plant permits issued by MDNR. Mitigation plans will be done to comply with the specific permit requirements. Additional construction permits may be required from local governments.

Q. Construction Impacts

Potential construction impacts are described in this section. While construction impacts would be more fully known when more detailed design plans have been completed, the municipalities will work with the public to address concerns during the final design of the project and would provide further coordination with impacted parties and individuals.

The cities' standard specifications for street construction include, but are not limited to, air, noise, and water pollution control measures, and traffic control and safety measures to minimize construction impacts. Pollution control measures, both temporary and permanent, would be enacted under the project construction specifications. During construction of the project, construction methods and operations would be conducted in accordance with Missouri Department of Natural Resources (MDNR) regulations, particularly concerning batch plant operations and clearing and grubbing functions.

1. WASTE DISPOSAL

Specifications and procedures for the disposal of wastes resulting from construction activity would be developed with consideration given to the MDNR Solid Waste Management Program. This program emphasizes the need to develop uses and markets for recycled and recyclable materials in construction activities. These materials include, but are not limited to, waste tires, rubberized asphalt, ground glass subgrade, structural steel, plastic lumber, and paints that utilize recycled glass. Furthermore, any potential hazards in the right-of-way would be identified and handled in accordance with all applicable regulations. In addition, the construction specifications would include requirements to prohibit the contractor from disposing of any pollutants, such as fuels, lubricants, raw sewage, or other harmful substances, inappropriately.

Impacts would be mitigated by adherence to construction permit and contract conditions. Materials resulting from clearing and grubbing, demolition, or other operations (except materials to be retained) would be removed from the project, or otherwise properly disposed of by the contractor.

2. WATER QUALITY

Construction impacts on water resources include both direct and indirect impacts. Water quality impacts during construction activities could include increased sediment load with resulting increased turbidity levels in Little Shoal Creek. The sediment increase could be due to runoff from cleared areas within the construction limits, earthmoving, and construction activities in or near stream channels. Disturbance of a stream channel during culvert or bridge construction could cause short-term increases in turbidity. Spillage of fuels, lubricants and other toxic materials during construction can impact the water quality of the streams. Turbid water and suspended solids may be discharged directly to streams from pumps used in de-watering activities during roadway, bridge and culvert construction. This would be a temporary impact during construction. Best Management Practices (BMPs) will be used to minimize the turbidity of the waters caused during construction. The implementation of standard sedimentation and erosion control measures and the careful handling of foundation spoils and toxic materials can reduce the potential for these construction impacts.

MDNR has noted that nutrients leached from project areas that have been hydro seeded and mulched can result in increased phosphorous levels in streams and adjacent water bodies, such as creeks and reservoirs. The Missouri Department of Conservation (MDC) has stated that the following best management practices should reduce impacts to the aquatic environment to a minimal level:

- Grade and seed disturbed areas as soon as possible and in compliance with the MDC seeding and planting recommendations;
- Minimize disturbances to the stream banks and riparian zones; and
- Avoid work in stream channels from the beginning of March to mid June as much as possible and practicable; and undertake all necessary precautions to prevent petroleum products from entering streams.

These best management practices, as outlined by the MDC, also include conformance to the State Channel Modification Guidelines when altering channels or relocating streams. Measures would be taken to ensure that proper flow conditions are maintained in the creeks and tributaries during construction. In addition, restoration work would include cleanup, shaping, replacement of topsoil, and establishment of vegetative cover on all disturbed bare areas, as appropriate, and in accordance with the project's landscaping plan.

3. AIR

Construction activity would cause temporary air quality impacts. These short-term effects would include the following:

- Increased emissions from heavy diesel construction vehicles and equipment. Emissions from construction vehicles and equipment would be controlled in accordance with emission standards prescribed under state and federal regulations.

- Increased emissions from vehicles as a result of decreased speeds through work zones. Efforts would be made to minimize these impacts by maintaining smooth traffic flow during construction periods.

- Increase in dust resulting from grading operations and exposed soils. Dust generated by construction activities would be minimized by the implementation of dust control measures, such as water sprinkling and applications of calcium chloride to control dust and other airborne particulates.

Contractors would be required to comply with Missouri's statutory regulations regarding air pollution control, which are designed to minimize air quality impacts by reducing air pollutants during construction. Air quality impacts would be mitigated by adherence to construction permit and contract conditions, which include prohibitions against burning of construction debris, and control measures to limit pollution if tree trunks and limbs are permitted to be burned on site.

4. NOISE

Noise from heavy construction equipment and haul trucks would result in unavoidable short-term impacts. Residents adjacent to the roadway would be most impacted by construction noise. In an effort to minimize the effects during construction, contractors may be required to equip and maintain muffling equipment for trucks and other machinery in order to minimize noise emissions. Operations with high temporary noise levels such as pile driving may need to have abatement restrictions placed upon it such as work-hour controls and maintenance of muffler systems.

5. VIBRATION

Due to the proximity of the alignment to schools and residential areas, if drilling and blasting are necessary for construction, a carefully planned and executed drilling and blasting program would be prepared during the design development phase, which would place limits or controls on drilling and blasting activities. The requirements of this program will be governed by local, state, and federal regulations, and coordination with affected groups will continue during the detailed design phase.

6. TRAFFIC IMPACTS

Flintlock Road will be constructed in phases near Liberty Drive and NE 76th Street. During all phases of construction, access will be maintained to the Bent Oaks Subdivision and to commercial businesses in the area. NE 76th Street will be closed during roundabout construction at Flintlock Road, and NE 76th Street traffic between Flintlock Road and Church Road will be rerouted on the local street networks. Prior to each phase of construction, emergency service agencies will be contacted and emergency vehicle access routes will be coordinated. Construction will need to be limited during peak traffic hours.

7. UTILITY RELOCATION

Most utilities in the study area are located in utility easements. Utilities located within the study corridor include overhead power transmission lines, underground power lines, gas lines, storm sewer, sanitary sewer, underground telephone/fiber optic lines, and water lines. Although utilities would have to be relocated, impacts are expected to be minor except for a crossing with the overhead power transmission lines which would require relocation of a support base for these lines. The Proposed Action avoids two sanitary lift stations and the existing triple box culverts under I-35 and Stewart Road.

R. Secondary and Cumulative Impacts

When a project has direct impacts, they occur at the same time and place. Secondary or indirect impacts are caused by the project but occur later in time and are farther removed in distance, and are reasonably foreseeable. Cumulative impacts are impacts on the environment that result from the incremental impact of the project when added to other past, present and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions.

The existing land use categories located within the study area are mostly undeveloped, including the wooded riparian corridor of Little Shoal Creek and the agricultural (pasture) area on the south side of NE 76th Street. The agricultural land is not considered to be prime farmland and all of the land is within city limits and is committed to urban development. The existing land use at the south end of the study area along Liberty Drive includes residential on the east side of Liberty Drive, and office, light industrial, and public/semi-public (Department of Social Services) on the west side of Liberty Drive. The existing land use at the northeast corner of the study area is light industrial and office. On the east edge of the study area, the existing land use is public/semi-public, with only the west edge of the South Valley Middle School and Junior High School athletic fields located in the study area.

Future land use for the study area on the west side of I-35 is categorized as low density residential and office, and includes the extension of Flintlock Road south of NE 76th Street. The existing land use is currently undeveloped and agricultural. On the east side of I-35, the future land use is the wooded area of Little Shoal Creek as an undeveloped area and designated as conservation land. It is currently owned by the Liberty Public School District. It is not public park land, wildlife refuge or flood buyout property. The future land use plan for the south Liberty area indicates that most of those lands previously shown as conservation lands in that area are designated as floodplain.

In evaluating secondary and cumulative impacts of the proposed project, project activities by others within or near the study area need to be considered. Construction of the South Valley Middle and Junior High Schools and new residential development north and south of I-35 have provided impetus for the proposed project. Recent improvements at the M-152 interchange (at I-35) and the Pleasant Valley interchange (I-35/US 69/Pleasant Valley Road/W Liberty Drive) have improved capacity and safety within the area. However, continued growth along the M-152 corridor, within the Liberty triangle, and along the south Liberty Parkway and Flintlock Road corridors will occur.

Flintlock Road south of Liberty Drive is currently under construction as part of the City of Liberty's South Liberty Parkway project. It is a four-lane divided arterial roadway with curb and gutter, plus an enclosed storm drainage system. Interstate 35, at the proposed overpass location is a four-lane interstate highway with a 30-foot grass median and asphalt shoulders. In the future, I-35 is planned to be widened to six-lanes with shoulders and a median safety barrier. This will be determined as part of a future Major Investment Study (MIS), according to the MARC's LRTP. South of this location, I-35 has been widened, which occurred into the existing median.

The study area is an emerging growth area that is identified in the City of Liberty's Economic Development Plan. The proposed project will increase the economic vitality of the region by providing a more direct connection between the growing commercial area near M-152 and Flintlock Road, and the planned commercial and office areas near the Flintlock tie-in to the South Liberty Parkway that is currently under construction. The secondary and cumulative

impacts will be the eventual conversion of current open space to low density residential and office, as planned within the project's study area, and its area of influence.

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